Report of the

Central Bureau Committee

General Merchandise Sub-division

American Warehousemen's Association

(Second Edition, March, 1921)

The within report is approved for submission to the General Merchandise Sub-division of the American Warehousemen's Association.

CENTRAL BUREAU COMMITTEE

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TO THE GENERAL MERCHANDISE SUB-DIVISION OF THE AMERICAN WAREHOUSEMEN'S ASSOCIATION:

GENTLEMEN:

In the performance of the duties assigned to your Committee they have followed the principle laid down in the 1918 Report, that their work should be strictly confined to preparing a standardized basis for rates from which the individual warehouseman could compute rates that would be equitable as between different commodities in his warehouse; rates that would produce the same net revenue from each and every class of goods whether stored in bulk or in assortment, in quantity or in small lots. They have assumed that not only was it no part of their duty to attempt to produce uniformity of price as between different warehouses, but that it was imperative they do nothing that would indicate or suggest a combination to establish such uniformity; to do so, whether or not it could be construed as a combination in restraint of trade, would be directly contrary to the evident intent with which they were appointed.

It has appeared to the Committee that in view of the increase in cost, both of construction and operation, the growing demand for services other than simple storage and handling, and the great advances we have made in our knowledge and understanding of warehouse expenses, customs and economics, their first and most pressing duty was to revise and bring up to date the 1918 Report. Valuable as that report was when made, it is already out of date and almost obsolete and in the present report they have endeavored to make it as of September, 1920.

The theory of the back piling of goods in assortment has been abandoned for the reason that the vast majority of building laws and regulations do not permit overloading any floor space to counterbalance underload or vacancy on adjoining space.

The car lot and assortment system has been replaced by the Lot Unit system for the reason that existing R. R. classifications are found to be inequitable and indefensible when applied to goods in warehouse, and several other minor changes have been made for similar reasons.

A Package Rating table has been added to this report covering Index, Floor-Load and Cubic Systems with a supplementary table for the Floor-Load System. This may be used in preparing tariffs, but it must be borne in mind that each warehouseman must "set" the table in accordance with his desired earnings per square foot just as he must set his watch according as he desires Eastern, Central, Mountain or Pacific time.

Your Committee realize that this report will appear complicated to a novice in warehousing, but that is inevitable. Just as an engineer requires a knowledge of mathematics, a lawyer a knowledge of law, a banker a knowledge of finance, so a warehouseman requires a knowledge of the fundamental principles of his business, and none of these may be acquired without study. There is no royal road to learning; no warehousemen's guide can be prepared that would enable a neophyte to become a warehouseman without preparation, experience and study, and as Mr. Dooley says, " 'tis better so." This report is of value only to those warehousemen who "want to know" and are willing to work for knowledge. Your Committee have worked long and hard to prepare it, but their labor will have been in vain unless you are willing to master and apply the results so far as they are directly applicable to your particular business, and to continue and modify them as your individual needs may require.

There have been five meetings of the Committee during the year, at Atlantic City February 2, 3 and 4; at Pittsburgh May 17, 18 and 19; at Minneapolis July 13, 14 and 15; at Louisville October 4, 5, 6 and 7; and at Boston October 20 and 21; also numerous meetings of sub-committees and conferences of individual members. Messrs. Jacobson of the New York Bureau, Carruth of the Massachusetts Association and Criss of the Central Bureau sat with the Committee at every meeting and rendered invaluable assistance, and the General Bureau Committee has been represented at every meeting by its chairman and one or more other members.

Every service rendered should be remunerative to the warehouse. To give anything for nothing necessitates an overcharge somewhere else.

GLOSSARY

Standard Pile is a pile containing the greatest quantity of a commodity that can be practically stored in bulk, not exceeding 8⅓ feet high nor 250 pounds per square foot of floor space occupied.

Lot Unit (L. U.) is the quantity of a commodity contained in a standard pile covering 120 square feet.

Height of Standard Pile is the theoretical height of the standard pile as computed from the gross weight per cubic foot of the commodity in pile. When it is not practical to pile as high as the theoretical point indicates, then the practical height is substituted.

Floor Load is the weight of a pile of goods per square foot of floor space occupied.

Index is the number of square feet of floor space occupied by a package in pile when stored to the maximum practical pile height (not exceeding 8⅓ feet), weight not considered.

Density is the weight per cubic foot of a commodity.

Assortment. A lot of goods is said to be in assortment when it contains more than one mark, brand or size to be stored and accounted for separately.

Pile Space is the floor space actually occupied by a pile of goods exclusive of entrance aisles made necessary by assortment or individual package delivery.

Available Space is the total floor space inside of walls after deducting elevators, stairways, office, shipping and laborers' rooms.

Occupiable Space is the available space less main, or permanent, aisles and columns.

Gross Space is based on outside measurement of building and includes space occupied by walls.

Honeycomb is the state, or condition, of a pile when partial delivery has reduced the number of packages in pile without proportionately reducing the floor space occupied.

Individual Package Delivery, sometimes called "Serial Number Delivery," is assortment carried to its extreme, wherein every package must be stored and accounted for separately.

Base Class is computed on not less than a lot unit of one mark, brand or size to be stored and accounted for separately.

Productive Labor Cost is the wage cost of laborers and checkers while actually engaged in an operation for which a charge is made.

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STANDARD WAREHOUSE TERMS AND CONDITIONS

PACKAGES

1. The warehouse undertakes to store and deliver goods only in the original packages in which they are received.

TENDER FOR STORAGE

2. All goods for storage are to be delivered at the warehouse properly marked and packed for handling, and the storer shall furnish at or prior to such delivery a manifest showing marks, brands or sizes to be kept and accounted for separately. Otherwise the goods will be stored in bulk or lots at the discretion of the warehouse and will be billed accordingly.

WAREHOUSE RECEIPTS

3. A warehouse receipt will be issued on each lot of goods stored. No charge will be made for the issuance of non-negotiable receipts.

STORAGE PERIODS

4. Unless otherwise provided, all commodities are stored on month to month contracts, and the warehouse reserves the right to require the removal of any goods within thirty days from next storage date. Only such notice as is reasonable or possible under the circumstances is required on perishable or hazardous goods.

STORAGE RATES AND EXPIRATION

5. Storage rates cover warehouse space required for one month or fraction thereof, dating from receipt of the first package, and are charged in advance from that date up to but not including same date of the following month. When the final expiring date falls on a Sunday or legal holiday, the next business day shall be deemed the expiring day.

TRANSFERS NEW CONTRACT

6. When goods in storage are transferred on the books of the warehouse from one party to another, a new contract is made thereby and a new storage date established on the date of such transfer.

BONDED STORES

7. Due to the extra expense of operating Bonded warehouses, an extra charge over regular storage, handling and other rates will be made for bonded merchandise.

INSURANCE

8. Storage rates do not include insurance of any kind and insurance rates, if quoted, are not guaranteed.

LIMITED LIABILITY

9. Liability of the warehouse for loss of or damage to goods stored shall in no case exceed eight dollars ($8.00) per cubic foot or twenty-five (25) cents per pound, according as weight or size determines the rate, unless excess value is declared by the customer at the time the goods are stored. A charge will be made for such excess value.

RESPONSIBILITY OF WAREHOUSE

10. The responsibility of the warehouse is defined by the laws of the State.

All goods are stored at owner's risk of loss or damage by civil or military authority, or insurrection, riot, strikes, enemies of the government, sprinkler leakage, flood, wind, storm, fire, moth, corruption, depredation of rats, mice or vermin, change of temperature, or by any cause beyond the control of the warehouse.

The warehouse will assume no responsibility for concealed damage, leakage of liquids, or for losses in weight by reason of defective or insufficient containers whether occurring when goods are on storage or are being handled, nor for failure to detect or remedy the same.

All storage, handling or other charges must be paid on goods lost, damaged or destroyed.

ACCESS TO GOODS

11. Customers, their representatives or workmen will not be allowed to have access to or work on goods in store unless accompanied by a warehouse employee, for whose time a charge will be made.

DELIVERY ORDERS

12. Orders signed in full and in writing will be required for the delivery of all goods, and reasonable precaution shall be taken by the owner in order that the warehouse may know definitely the goods desired and make proper delivery.

EXCESS DELIVERIES

13. A charge will be made for an excessive number of deliveries from any one lot.

TIME FOR EFFECTING DELIVERY

14. When goods in store are ordered out, a reasonable time shall be given the warehouse to execute the order. Inability to effect delivery before expiring storage dates shall not prevent assessing the storage charge for another month.

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HANDLING

15. Handling charges cover only the ordinary labor and duties incidental to receiving goods at warehouse door, stowing and delivering at warehouse door, and do not include loading or unloading cars, trucks or other vehicles. Handling charges will be billed with the storage charge for the first month.

UNLOADING CARS

16. Charges for unloading cars include the use of tracks, platforms, etc., and the labor of unloading.

LOADING CARS

17. Charges for loading cars cover the use of tracks, platforms, etc., and the labor of loading cars.

DEMURRAGE

18. Demurrage will not be absorbed by the warehouse, but diligence will be used to load or unload cars promptly.

DISTRIBUTION

19. Distribution charges cover the checking out and delivery of goods at car within the time specified by the warehouse. Previous to the unloading, notice shall be given stating the number of packages wanted, brands, sizes, etc., and to whom they are to be delivered. The charge for distribution is additional to the car unloading.

DRAYAGE

20. Drayage charges cover ordinary cartage of goods and delivery at platform or sidewalk. When delivery is required in basement or on upper floors or other inconvenient places, an extra charge will be made.

SHIPPING

21. Shipping charges cover billing, marking or tagging, procuring bills of lading and mailing same. A separate charge will be made for each express or parcel post shipment.

FURNISHING SPACE, LIGHT, TOOLS, Etc.

22. Whenever warehouse space, light, power, tools or material of any sort are supplied or loaned by the warehouse, a charge will be made therefor.

WEIGHING, SAMPLING, COOPERING, Etc.

23. A charge will be made for weighing, sampling, coopering and other miscellaneous services when performed by the warehouse.

EXTRA LABOR

24. Charges will be assessed for extra labor furnished by the warehouse, whether common, skilled or clerical.

TAKING DOWN, REPILING, Etc.

25. When goods are taken down and repiled in store for weigher or other convenience of customer, the handling charge of receiving and delivering will be applied.

COLLECTIONS

26. A charge will be made for making collections for customers.

CASH ITEMS ADVANCED

27. Freight and other cash items advanced become a lien on the goods stored, and are payable on demand. A charge for this service will be made. Deliveries or transfers from such lots will not be made until lien is satisfied.

STOCK STATEMENTS

28. Stock statements submitted in duplicate by customer will be checked with the books of the warehouse without charge.

A charge will be made for warehouse checking or stock taking.

GROSS WEIGHTS

29. When rates are quoted by weight, they will be computed on the gross weight.

TON

30. The term "TON" when used means two thousand (2000) pounds.

MINIMUM CHARGES

31. Minimum ratings will be applied on storage, handling or other service charges.

POSTAGE

32. Postage and addressed envelopes must be furnished by customers requiring notification of shipments or deliveries and reports.

CHARGES DUE

33. All charges become due when billed.

LABOR DISPUTES, STRIKES, Etc.

34. The warehouse will not be responsible for delays in receiving or delivering merchandise by reason of labor disputes, strikes or any other causes beyond the control of the warehouse.

STATE LAWS

35. Nothing herein contained shall be deemed a waiver or modification of the rights of the warehouse under the laws of the State.

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STANDARD BASIS FOR CLASSIFICATION OF GOODS FOR STORAGE

The infinite variety of packages offered for storage, varying in weight from ten to three thousand pounds, in size from one-half to one hundred and fifty cubic feet, and in shape from perfect symmetry to the irregularity of an uncrated piece of machinery; the wide variation in the nature of the commodities and the consequent different requirements as to care, location and handling, and the great difference in value, all combine to make classification a complicated and difficult task. We believe, however, practically all of the goods offered for storage can be properly classified, and in a manner that is comparatively simple for the operating force.

It is all important that the factors used in any classification shall rest on a defensible foundation, and serious consideration has been given to the work along this line, particularly to the questions of height of pile and floor load, and laws relative to use and occupancy when once these two points are fixed. Certainly no classification could be of value that did not comply with the law and the insurance regulations.

The Lot Unit, which is the basis of our classification in this work, is derived from the quantity by weight of goods that can be piled on a floor space of 120 square feet. This space is selected because it approximates one-half the floor space of an average car load of goods, and also, because it makes an acceptable pile in the warehouse, where it conveniently forms a space for goods 20 feet deep by 6 feet wide. This space, on being loaded to our standard floor load limit of 250 pounds per square foot, produces 30,000 pounds, which is our Base Lot Unit if the goods can be piled within the height of a Standard Pile of 8⅓ feet. If the commodity in storage happens to be of a lower density, giving a less floor load, its Lot Unit is reduced in direct proportion to the floor load obtained. These comparisons follow in a Floor-Load Classification Table, which is subject, however, to modifications peculiar to the nature of the goods and varied earnings required per square foot of floor. For convenient comparisons we have the 120 square feet of floor space with a standard height of a pile of 8⅓ feet producing 1000 cubic feet as the maximum amount of storage space for a Lot Unit.

The classification table herewith is arranged to produce respectively gross storage earnings of 6.25, 7.56, 10.07, 12.18, 14.74 and 16.21 cents per square foot per month and intended to meet various costs and conditions, the first covering construction and operation of Standard Warehouse in April, 1916, and the last covering construction and operation of same warehouse in September, 1920, but it can easily be rearranged to produce earnings varying by 10 per cent steps to cover any desired earning per square foot.

Less Than Full Lot Unit Quantity

The demand for service of various kinds makes it necessary to provide a segregation of the quantity adopted for the base classification, and here we are confronted with the complicating factors of assortment, decreased piling height due to instability of pile in small unit, excessive honeycomb, excessive delivery costs, etc.

It is no longer a theory but a fact, that a serious matter confronts the industry with the changed character of the business offered warehousemen in recent years, enhancing costs very materially and adding much to the warehouseman's responsibility.

Statistical data are fundamental and although cost accountants have recently revealed many facts on costs of specific services pertaining to storing and handling goods, particularly in small units, yet it is practically impossible to combine the known facts in a formula that will in all cases do justice to storer and warehousemen alike without an excessive amount of special charges, complicating the rating system and not desired by either party.

In view of this present and ever-increasing demand for service it is manifestly unjust to apply to all receipts the average cost of storing or handling a commodity under all conditions, and the result of such practice must be obvious to all thinking warehousemen.

The situation demands that warehousemen meet this condition in some practical way, and after due consideration of all information available it seems best to assume that the storer who elects to store his goods in small units is dealing with the warehouseman in a retail way and therefore should bear the burden, an assumption that may or may not be true in specific cases but nevertheless is representative of the trend of costs and a recognized principle in commercial activity.

The above conclusion is reached on the further assumption that each car of goods received shall be computed on its own basis and as such the sorting would be included in the rate. If, however, the shipment consists of more than one car, each containing assortment but to be accumulated for storage in full lot unit quantities or more, the warehouseman would be entitled to extra reimbursement for the extra service involved.

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Individual Package Delivery

I. P. D., although it is "less than Lot Unit" carried to its extreme and differs therefrom only in degree, requires somewhat different consideration. In L. L. U. a percentage is used that is assumed to represent the average waste of space due to aisles and honeycomb in the various sizes of lot. A lot of less than five packages is rare and the percentages are estimated on a much higher average; in I. P. D. the lot is one package. 33⅓ per cent aisles are generally sufficient, but in the case of small packages a wider aisle may be required to admit a man or a truck. This also occurs in the case of irregular-sized packages such as case goods or dry goods, the aisle having to admit the maximum package.

Height of pile is also limited to a point lower than that indicated in L. L. U. owing to the increased instability of pile and excessive cost of delivery of packages in the lower tiers. Experience demonstrates that four packages high is an extreme limit; that two high is the height most often indicated; and that one high is much more frequent than anything over two.

Small Packages

Theoretically, small packages of a commodity can be stored at proportionate rates per cwt. to that of the larger packages of the same commodity, but this does not appear to work out under practical operating conditions. In many cases the instability of the pile when partial delivery of the lot takes place necessitates the removal of goods in the upper tiers to a lower level; fragility of package oftentimes will not permit of rehandling broken lots for the purpose of making space for other goods and the excessive cost of rehandling all tend towards excessive honeycomb of the house. The absence of statistics to indicate the extent of this loss makes it necessary to accept some arbitrary figure in the computation of the rate. Furthermore it seems advisable to fix a minimum charge on small packages regardless of weight. This increased charge may be avoided if the manufacturer will pack or strap small units into one larger unit for which he will receive a lower rating per 100 pounds than he would otherwise obtain.

HOW TO APPLY FLOOR-LOAD CLASSIFICATION TABLE

1st. When the commodity is in a case, paper container, barrel or other cooperage, compute the cubic content of the package in feet and add 5 per cent for loss in pile. For all other types of packages compute the cubic content from pile measurement. If it is not possible to obtain pile measurement, then package measurement may be used, in which event there should be added 10 per cent for loss of space in pile.

NOTE. — The square of the greatest diameter governs in the measurement of cylindrical packages.

2d. Divide weight of package by cubic feet of package **in pile**, thus obtaining weight per cubic foot of package in pile.

3d. Multiply the weight per cubic foot of package in pile by the height to which commodity can practically be piled (not to exceed 8⅓ feet), thus obtaining the floor load.

4th. The floor load applied to the table indicates the classification to which the Standard Modifications, if any, are applied.

5th. Apply resultant classification to package rate table.

Every service rendered should be remunerative to the warehouse. To give anything for nothing necessitates an overcharge somewhere else.

FLOOR-LOAD CLASSIFICATION TABLE

Rate in cents per 100 lbs. required to earn in cents per sq. ft. per month*						Class	Floor Load (lbs. per sq. ft.)	Lot Unit Weight
†6.25	7.56	10.07	12.18	14.74	‡16.21			
1.17	1.41	1.88	2.27	2.75	**3.02**	h—		
1.28	1.55	2.07	2.50	3.02	**3.33**	g—		
1.41	1.71	2.27	2.75	3.33	**3.66**	f—		
1.55	1.88	2.50	3.02	3.66	**4.03**	e—		
1.71	2.07	2.75	3.33	4.03	**4.43**	d—		
1.88	2.27	3.02	3.66	4.43	**4.87**	c—		
2.07	2.50	3.33	4.03	4.87	**5.36**	b—		
2.27	2.75	3.66	4.43	5.36	**5.89**	a—		
2.50	3.02	4.03	4.87	5.89	**6.48**	A	238.64 up	30,000
2.75	3.33	4.43	5.36	6.48	**7.13**	B	216.94	27,000
3.02	3.66	4.87	5.89	7.13	**7.85**	C	197.22	25,000
3.33	4.03	5.36	6.48	7.85	**8.63**	D	179.29	23,000
3.66	4.43	5.89	7.13	8.63	**9.49**	E	162.99	20,000
4.03	4.87	6.48	7.85	9.49	**10.4**	F	148.17	19,000
4.43	5.36	7.13	8.63	10.4	**11.5**	G	134.70	17,000
4.87	5.89	7.85	9.49	11.5	**12.6**	H	122.46	15,000
5.36	6.48	8.63	10.4	12.6	**13.9**	J	111.33	14,000
5.89	7.13	9.49	11.5	13.9	**15.3**	K	101.21	13,000
6.48	7.85	10.4	12.6	15.3	**16.8**	L	92.00	12,000
7.13	8.63	11.5	13.9	16.8	**18.5**	M	83.64	11,000
7.85	9.49	12.6	15.3	18.5	**20.4**	N	76.04	10,000
8.63	10.4	13.9	16.8	20.4	**22.4**	O	69.12	9,000
9.49	11.5	15.3	18.5	22.4	**24.6**	P	62.84	8,000
10.4	12.6	16.8	20.4	24.6	**27.1**	Q	57.13	7,000
11.5	13.9	18.5	22.4	27.1	**29.8**	R	51.93	6,500
12.6	15.3	20.4	24.6	29.8	**32.8**	S	47.21	6,000
13.9	16.8	22.4	27.1	32.8	**36.1**	T	42.92	5,500
15.3	18.5	24.6	29.8	36.1	**39.7**	U	39.02	5,000
16.8	20.4	27.1	32.8	39.7	**43.6**	V	35.47	4,500
18.5	22.4	29.8	36.1	43.6	**48.0**	W	32.25	4,000
20.4	24.6	32.8	39.7	48.0	**52.8**	X	29.32	3,500
22.4	27.1	36.1	43.6	52.8	**58.1**	Y	26.65	3,500
24.6	29.8	39.7	48.0	58.1	**63.9**	Z	24.23	3,000
27.1	32.8	43.6	52.8	63.9	**70.3**	Aa	22.03	2,800
29.8	36.1	48.0	58.1	70.3	**77.3**	Bb	20.02	2,500
32.8	39.7	52.8	63.9	77.3	**85.0**	Cc	18.20	2,300
36.1	43.6	58.1	70.3	85.0	**93.5**	Dd	16.55	2,100
39.7	48.0	63.9	77.3	93.5	**103**	Ee	15.04	1,900
43.6	52.8	70.3	85.0	103	**113**	Ff	13.68	1,700
48.0	58.1	77.3	93.5	113	**124**	Gg	12.43	1,600
52.8	63.9	85.0	103	124	**137**	Hh	11.30	1,400

* These rates presuppose an occupancy of 50 per cent of available space, therefore the earnings per available square foot of space would be one-half of the amounts given.

† Arranged to conform to "Standard Warehouse" as of 1916.

‡ Arranged to conform to "Standard Warehouse" as of 1920.

NOTE. — The letter "I" has been purposely omitted in the classification. The Lot Unit quantity applies to the base classification of commodities. Minus classes (a—, b—, c—, etc.) to be used for storage below Standard such as open or yard storage.

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EXAMPLES ILLUSTRATING METHODS OF APPLYING SYSTEM FOR CLASSIFYING COMMODITIES FOR STORAGE

The following examples are taken from actual instances of goods offered for storage where actual measurements were taken.

Example No. 1

A lot consisting of 1920 boxes of prunes measuring 1.3 feet × .81 foot × .51 foot and having a gross weight of 28.5 pounds each.

Method:

1.3 × .81 × .51 = .537 (cubic foot package).
.537 + .0268 (5% loss in pile) = .564 (cubic foot package in pile).
28.5 divided by .564 = 50.53 pounds (weight per cubic foot package in pile).
50.53 × 8.16 (16 high × .51) = 412.32 pounds (floor load).
412.32 pounds applied to table = Base class A, to which should be added modifications if any.

Note. — In order to maintain a standard floor load of 250 pounds per square foot, these goods can be piled to a height of only 4.95 feet.

250 pounds divided by 50.53 = 4.95 feet (height of standard pile).

Example No. 2

Storage rates are desired on a lot of roofing paper in rolls 3 feet high × .53 foot in diameter and weighing 35 pounds.

Note. — Owing to instability and to the length of the vertical dimension, this commodity cannot be piled higher than 2 on end and the practical pile height is, therefore, 6 feet.

Method:

.53 × .53 × 3 = .843 (cubic foot package).
.843 + .042 (5% loss in pile) = .885 (cubic foot package in pile).
35 divided by .885 = 39.55 pounds (weight per cubic foot package in pile).
39.55 × 6 = 237.30 pounds (floor load).
237.30 pounds applied to table = Base class B, to which should be added modifications if any.

Example No. 3

240 bags of walnuts, each 3.10 feet × 1.60 feet × 1.04 feet and weighing 108 pounds, are stored in a space 10.5 feet long × 15.3 feet wide × 8.3 feet high.

Method:

10.5 × 15.3 × 8.3 = 1333.395 cubic feet of pile space.
1333.395 divided by 240 = 5.56 (cubic feet package in pile).
108 divided by 5.56 = 19.42 (weight per cubic foot package in pile).
19.42 × 8.3 = 161.19 pounds (floor load).
161.19 pounds applied to table = Base class F, to which should be added modifications if any.

STANDARD MODIFICATIONS WITH ILLUSTRATIONS

1. Excess Value. — Vanilla Beans, Silks, Pig Tin.
2. Fragility. — Either of package or contents.
3. Especial susceptibility to damage or claims. — Fine Tobaccos, Delicate Fabrics.
4. Liability to cause damage. — Molasses, Dye Stuffs.
5. Excess care, attributable to leakage. — All Liquids.
6. Excess care, attributable to temperature. — Fruits and Vegetables.
7. Isolation. — Tea.
8. Attractive to vermin. — Peanuts in shell.
9. Hazardous. — Vegetable Fibre, Varnishes.
10. Malodorous. — Grease Wools.
11. Dusty. — Cement, Alkali.
12. Mussy. — Dates, Glucose.
13. Requiring access for examination or treatment. — Olives or Cherries in casks.
14. Special.

When information is disseminated from a central bureau, a numerical list of modifications and information will be found a convenient method of notifying the warehouseman of the nature of the commodity although it may not require any modification of the storage charge if stored in warehouses where such goods are handled in quantity.

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TABLE SHOWING PERCENTAGES OF INCREASE AND DECREASE FROM STANDARD

Class h—	=	53.3%	decrease	Class N	=	213.8%	increase
" g—	=	48.7%	"	" O	=	245.2%	"
" f—	=	43.6%	"	" P	=	279.7%	"
" e—	=	37.9%	"	" Q	=	317.7%	"
" d—	=	31.7%	"	" R	=	359.5%	"
" c—	=	24.9%	"	" S	=	405.4%	"
" b—	=	17.4%	"	" T	=	456.0%	"
" a—	=	9.1%	"	" U	=	511.6%	"
" A	=	STANDARD		" V	=	572.7%	"
" B	=	10.%	increase	" W	=	640.0%	"
" C	=	21.%	"	" X	=	714.0%	"
" D	=	33.1%	"	" Y	=	795.4%	"
" E	=	46.4%	"	" Z	=	885.0%	"
" F	=	61.1%	"	" Aa	=	983.5%	"
" G	=	77.2%	"	" Bb	=	1092.%	"
" H	=	94.9%	"	" Cc	=	1211.%	"
" J	=	114.4%	"	" Dd	=	1342.%	"
" K	=	135.8%	"	" Ee	=	1486.%	"
" L	=	159.4%	"	" Ff	=	1645.%	"
" M	=	185.3%	"	" Gg	=	1819.%	"

A SHORTER METHOD OF CLASSIFICATION

The following table is arranged for classifying commodities in cases, paper containers and barrels or other cooperage. Cognizance of a 5 per cent loss in pile has been taken in calculating the table.

How to Apply the Table

1. Compute the weight per cubic foot of the package and apply to the table.
2. Determine the height to which the commodity can be practically piled and select the corresponding pile height column of the table. If the acquired pile height falls between columns, take the column showing the lower pile height figure.
3. The intersection of the line acquired under (1) with the column acquired under (2) indicates the base class.

Example

A lot of roofing paper in rolls 3 feet high by .53 foot in diameter and weighing 35 pounds is offered for storage.

Method:

.53 × .53 × 3 = .843 (cubic foot package).
35 divided by .843 = 41.52 pounds (weight per cubic foot of package).
41.52 applied to table falls in the 5th line.

Note. — Owing to instability and the length of the vertical dimension, this commodity can be tiered 2 high on end, making the practical pile height 6 feet.

Applying the acquired pile height to the table, it is found to fall between columns 4 and 5 and the pile height column to use is, therefore, number 5.

The intersection of line 5 and column 5 indicates that the

Base class = B

to which should be added modifications if any.

Note. — This table may be used for commodities in containers other than those specified by following the method outlined and modifying the resultant base class one class to take care of the greater loss of space in pile, but this method is not so nearly accurate as the floor-load method hereinbefore described.

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SHORTER METHOD CLASSIFICATION TABLE

Pounds per cu. ft. Pkg. measurement	Tables 1	2	3	4	5	6	7	8
58.60 or over	A	A	A	A	A	A	A	A
53.27 to 58.59	A	A	A	A	A	A	A	B
48.43 " 53.26	A	A	A	A	A	A	B	C
44.03 " 48.42	A	A	A	A	A	B	C	D
40.03 " 44.02	A	A	A	A	B	C	D	E
36.39 " 40.02	A	A	A	B	C	D	E	F
33.08 " 36.38	A	A	B	C	D	E	F	G
30.07 " 33.07	A	B	C	D	E	F	G	H
27.34 " 30.06	B	C	D	E	F	G	H	J
24.85 " 27.33	C	D	E	F	G	H	J	K
22.60 " 24.84	D	E	F	G	H	J	K	L
20.54 " 22.59	E	F	G	H	J	K	L	M
18.67 " 20.53	F	G	H	J	K	L	M	N
16.98 " 18.66	G	H	J	K	L	M	N	O
15.43 " 16.97	H	J	K	L	M	N	O	P
14.03 " 15.42	J	K	L	M	N	O	P	Q
12.76 " 14.02	K	L	M	N	O	P	Q	R
11.60 " 12.75	L	M	N	O	P	Q	R	S
10.54 " 11.59	M	N	O	P	Q	R	S	T
9.59 " 10.53	N	O	P	Q	R	S	T	U
8.71 " 9.58	O	P	Q	R	S	T	U	V
7.92 " 8.70	P	Q	R	S	T	U	V	W
7.20 " 7.91	Q	R	S	T	U	V	W	X
6.55 " 7.19	R	S	T	U	V	W	X	Y
5.95 " 6.54	S	T	U	V	W	X	Y	Z
5.41 " 5.94	T	U	V	W	X	Y	Z	Aa
4.92 " 5.40	U	V	W	X	Y	Z	Aa	Bb
4.47 " 4.91	V	W	X	Y	Z	Aa	Bb	Cc
4.07 " 4.46	W	X	Y	Z	Aa	Bb	Cc	Dd
3.70 " 4.06	X	Y	Z	Aa	Bb	Cc	Dd	Ee
3.36 " 3.69	Y	Z	Aa	Bb	Cc	Dd	Ee	Ff
3.06 " 3.35	Z	Aa	Bb	Cc	Dd	Ee	Ff	Gg
2.78 " 3.05	Aa	Bb	Cc	Dd	Ee	Ff	Gg	Hh
Ht. of pile in ft.	8.333	7.576	6.887	6.261	5.692	5.174	4.704	4.276

(See explanation on page 11.)

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RATE MAKING BY INDEX, FLOOR-LOAD AND CUBIC SYSTEMS

Herewith is offered a set of 20 triple column tables for acquiring package rates under the Index, Floor-Load and Cubic Systems with 12 additional tables for the Floor-Load System only. As stated in the introduction to this Report, it is necessary first to "set" the tables to produce the desired earning per square foot. By way of illustration the tables are "set" to show six different earnings per square foot, viz.: 16.21, 14.74, 12.18, 10.07, 7.56, 6.25 cents, and may be set to acquire other earnings merely by placing class A at the head of the proper table. The other class letters follow (if "plus") or precede (if "minus") in sequence.

At the head of the first column (of the three column tables) is indicated the earning per square foot, at the head of the second column the rate per 100 pounds, and at the head of the third column the rate per cubic foot; therefore the warehouseman, having determined upon his earning basis, selects the table indicating that basis at the head of its first column. This table becomes class A, the next table class B and so on. Directions for acquiring package rates under all three systems with illustrative examples follow.

INDEX SYSTEM

DEFINITION: Index is the number of square feet of floor space occupied by a package in pile when stored to the maximum practical pile height (not exceeding 8⅓ feet), weight not considered.

METHOD OF COMPUTING INDEX: When the package is a case, paper container, barrel or other cooperage, the Index should be computed from package measurement with an allowance of 5% for loss of space in pile. For all other types of packages the Index should be acquired from pile measurement. If it is not possible to obtain pile measurement, then package measurement may be used, in which event there should be added 10% for loss of space in pile.

INDEX FROM PACKAGE MEASUREMENT: Find the number of square feet in the horizontal face of the package, i. e. the face that is to rest upon the floor. Add a percentage as hereinbefore instructed to provide for loss of space in pile. Divide by the number of packages high that the commodity can be tiered practicably. The result is the Index. (NOTE. — The square of the greatest diameter governs in the measurement of cylindrical packages.)

FORMULA:

$$\frac{\text{Floor surface of package} + \quad \%\ \text{loss}}{\text{No. of pkgs. in maximum practical pile}} = \text{Index.}$$

ILLUSTRATIONS: A case 2 feet × 2 feet × 2½ feet. Floor surface 2 × 2.5 = 5 square feet + .25 (5% loss in pile) = 5.25 square feet divided by 4 (number of packages high in practical pile) = 1.31 (Index).

A barrel 2.85 feet long by 2.08 feet in diameter. If piled on end, we have 2.08 × 2.08 = 4.3264 square feet + .21632 (5% loss in pile) = 4.54272 square feet divided by 2 (number of packages high in practical pile) = 2.27 (Index). If piled on bilge, 2.85 × 2.08 = 5.928 square feet + .2964 (5% loss in pile) = 6.2244 square feet divided by 4 (number of packages high in practical pile) = 1.56 (Index).

INDEX FROM PILE MEASUREMENT: Ascertain the number of square feet of floor surface occupied and divide by the number of packages in the pile. The resultant figure (square feet package in pile) is the Index providing that the goods are stacked to the maximum practical pile height. Where the actual pile height is above or below the practical limit, then, having acquired the number of square feet per package in pile, multiply by the actual pile height and divide the result by the maximum practical pile to acquire the Index. An alternative method, where there is even piling, is to multiply the square feet per package in pile by the actual number of tiers high and divide the result by the maximum practical number of tiers high.

FORMULA:

$$\frac{\text{Square feet pile}}{\text{Number of packages}} \times \frac{\text{Actual pile height}}{\text{Maximum practical pile height}} = \text{Index.}$$

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ILLUSTRATIONS: 234 bags of cocoa beans are stored in a space 25.5 feet long × 6.0 feet wide × 8.0 feet high. 25.5 feet × 6.0 feet = 153 square feet divided by 234 = .65 (Index).

20 bags of walnuts are stored in a space 5.35 feet long × 4.35 feet wide × 5.05 feet high.

(a) 5.35 × 4.35 = 23.2725 square feet divided by 20 = 1.1636 (square feet package in pile). 1.1636 × 5 (actual number tiers high) = 5.818 divided by 8 (practical number tiers high) = .73 (Index).

(b) 1.1636 × 5.05 (actual pile height) = 5.87618 divided by 8.10 (practical pile height) = .73 (Index).

In acquiring the Index we have not heretofore considered the weight of the package. It will be seen, therefore, that Index applies primarily to a "low density" commodity, i. e. one that, when piled to its maximum practical pile height, will produce a floor load (weight per square foot of floor space) of less than 250 pounds. If the actual weight of the package is such as to produce a floor load of 250 pounds or more, then we have what is termed a "high density" commodity and the rate is a simple matter of x cents per 100 pounds. The dividing line between the two types, "low density" and "high density," is indicated by a "balancing weight," so to speak, usually termed the "limiting weight." It is found by multiplying the Index by 250.

FORMULA:

Index × 250 = Limiting weight.

ILLUSTRATION: In a previous example we found the Index of a lot of cocoa beans to be .65, which when multiplied by 250 produces a weight limit of 162.5 pounds. This means that if the actual weight of the package is less than 162.5 pounds we have a "low density" commodity, while if the actual weight exceeds 162.5 pounds then we have a "high density" commodity. If the commodity is of "low density," then the Index times the desired earning per square foot produces the package rate. If of "high density," the actual weight of the package times the desired rate per 100 pounds produces the package rate.

HOW TO USE THE TABLES: Compute the Index as hereinbefore directed and apply it to the first column of the table indicating the desired rate per square foot. When the Index falls between figures, take the larger. Note the corresponding weight limit figure in the second column. If the actual weight of the package does not exceed the indicated "weight limit," then on the same line in the central column of the page will be found the package rate. If the actual weight of the package exceeds the indicated "weight limit," then apply the actual weight of the package to the "weight limit" column of the table. If the weight falls between figures, select the larger. On the same line in the central column of the page will be found the package rate.

ILLUSTRATION: Cocoa beans, Index .65, weight of package 145 pounds, to earn 16.21 cents per square foot. Applying the Index to the first column of class A (16.21 basis), it is found to fall between .617 and .771 and having taken the larger figure we find the weight limit to be 192.8 pounds. As the actual weight of the package was 145 pounds, the package rate is, therefore, 12½ cents. Had the actual weight been 200 pounds, we would acquire a package rate of 15 cents.

FLOOR-LOAD SYSTEM

All commodities are classified in accordance with the Floor-load table as hereinbefore explained. It is only necessary to apply the weight of the package to the "weight limit" column of the proper class applicable to the desired earning per square foot.

ILLUSTRATION: 234 bags of cocoa beans at 145 pounds each are stored in a space 25.5 feet long × 6 feet wide × 8 feet high, to earn 16.21 cents per square foot.

25.5 × 6.0 × 8.0 = 1224 cubic feet of pile space.

1224 divided by 234 = 5.23 cubic feet package in pile.

145 divided by 5.23 = 27.725 pounds per cubic foot package in pile.

27.725 × 8 (practical pile height) = 221.8 Floor load.

221.8 Floor load = class B.

Applying the weight of the package at 145 pounds to the "weight limit" column of class B (16.21 basis), we acquire a rate of 12½ cents per package. (Compare with the same example under Index and Cubic Systems.)

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CUBIC SYSTEM

In this system the course of procedure does not materially differ from the Index System. If the package is a case, paper container, barrel or other cooperage, compute the cubic content of the package and add 5 per cent for loss in pile. For all other types of package compute the cubic feet per package in pile from pile measurement. If it is not possible to obtain pile measurement, then package measurement may be used, in which event there should be added 10 per cent for loss of space in pile. Note the height to which the package may be practically piled.

TO USE THE TABLES: Select the class indicating the desired rate per square foot. This is the base table. If the package can be piled 7.96 feet or more, then apply the acquired cubic feet of package in pile to the third column of the table. If it falls between figures, select the larger. Note the "weight limit" in the second column on the same line. If the actual weight of the package does not exceed the "weight limit," then the package rate is found on the same line in the central column of the page. If the actual weight of the package exceeds the "weight limit," then apply the actual weight of the package to the "weight limit" column of the table. If the weight falls between figures, take the larger. On the same line in the central column of the page will be found the package rate.

PILE HEIGHT MODIFICATION: If the package can be practically piled less than 7.96 feet, then, in accordance with the instructions at the bottom of each page, advance from the Base class the requisite number of classes. Apply to the resultant class the cubic feet of package in pile as before. Apply also the actual weight of the package to the "weight limit" column of the **Base class.** The higher rate applies.

ILLUSTRATIONS: 234 bags of cocoa beans at 145 pounds are stored in a space 25.5 feet long × 6.0 feet wide × 8.0 feet high, to earn 16.21 cents per square foot.

25.5 × 6.0 × 8 = 1224 cubic feet divided by 234 = 5.23 cubic feet package in pile. Applying 5.23 cubic feet to the third column of class A (16.21 basis), we acquire a package rate of 12½ cents, as the actual weight of the package at 145 pounds is less than the "weight limit" of 192.8 pounds. Had the actual weight been 200 pounds, we would acquire a package rate of 15 cents. (Compare with illustrative example under "Index System.")

A barrel 2.85 feet long × 2.08 feet in diameter weighing 500 pounds, to earn 16.21 cents per square foot to be stored on end.

2.08 × 2.08 × 2.85 = 12.33 cubic feet + .6165 (5% loss in pile) = 12.95 cubic feet package in pile. Pile height = 2 × 2.85 = 5.7 feet requiring a modification of 4 classes.

Modifying class A (16.21 basis), 4 classes, we find the modified class to be class E (16.21 basis). Applying 12.95 cubic feet to the third column of class E (16.21 basis), we acquire a package rate of 40 cents. Applying 500 pounds to the base class — class A (16.21 basis), we get a package rate of 35 cents. The rate to apply is, therefore, 40 cents. Had the actual weight of the package been 750 pounds, we would acquire a rate of 50 cents. Under the "Index" system we found the Index of this barrel (tiered on end) to be 2.27, and 2.27 applied to the first column of class A (16.21 basis) produces a rate of 40 cents on the 500-pound barrel and 50 cents on the 750-pound barrel.

HANDLING RATES

In applying to the following tables the information acquired by means of the instructions heretofore given it must be borne in mind that, having ascertained the storage package rate, it does not necessarily follow that a correct handling rate is to be found on the same line; in fact experience demonstrates that the appropriate classification for the handling rate of a given commodity is almost invariably greater than the storage rate classification. The handling column must be ascertained in accordance with proper cost finding methods as outlined on pages 25 and 26. Having thus acquired the correct rate per 100 pounds, the warehouseman should then select the table at the top of which is indicated the rate per 100 pounds nearest to the rate calculated and application of the package weight to the column selected will give the proper rate per package.

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PACKAGE RATE TABLE

FOR INDEX, FLOOR-LOAD AND CUBIC SYSTEMS

If Base Is	This Class Is	If Base Is	This Class Is	Storage Classes	If Base Is	This Class Is	If Base Is	This Class Is
16.21	o–	**16.21**	n–		**16.21**	m–	**16.21**	l–
14.74	n–	14.74	m–		14.74	l–	14.74	k–
12.18	l–	12.18	k–		12.18	j–	12.18	h–
10.07	j–	10.07	h–		10.07	g–	10.07	f–
7.56	f–	7.56	e–		7.56	d–	7.56	c–
6.25	d–	6.25	c–		6.25	b–	6.25	a–

Cts. per Sq. Ft. 4.27	Cts. per Cwt. 1.71	Cts. per Cu. Ft. .51	Cts. per Sq. Ft. 4.70	Cts. per Cwt. 1.88	Cts. per Cu. Ft. .56	RATES — CENTS PER PACKAGE						Cts. per Sq. Ft. 5.17	Cts. per Cwt. 2.07	Cts. per Cu. Ft. .62	Cts. per Sq. Ft. 5.68	Cts. per Cwt. 2.27	Cts. per Cu. Ft. .68
						Storage			Handling								
Index	Wt. Limit	Cubic	Index	Wt. Limit	Cubic	L. U.	1/3 L. U.	1/10 L. U.	L. U.	1/3 L. U.	1/10 L. U.	Index	Wt. Limit	Cubic	Index	Wt. Limit	Cubic
.117	29.3	.976	.106	26.6	.887	½	¾	1	**1**	**1¼**	**1½**	.097	24.2	.807	.088	22.0	.733
.176	43.9	1.46	.160	39.9	1.33	¾	1	1¼	**1½**	**2**	**2¼**	.145	36.3	1.21	.132	33.0	1.10
.234	58.6	1.95	.213	53.2	1.77	1	1¼	1½	**1½**	**2**	**2¼**	.194	48.4	1.61	.176	44.0	1.47
.293	73.2	2.44	.266	66.6	2.22	1¼	1¾	2	**2**	**2½**	**3**	.242	60.5	2.02	.220	55.0	1.83
.351	87.8	2.93	.319	79.9	2.66	1½	2	2¼	**2**	**2½**	**3**	.290	72.6	2.42	.264	66.0	2.20
.410	102.5	3.42	.373	93.2	3.11	1¾	2¼	3	**2½**	**3**	**4**	.339	84.7	2.82	.308	77.0	2.57
.469	117.1	3.90	.426	106.5	3.55	2	2½	3	**2½**	**3**	**4**	.387	96.8	3.23	.352	88.0	2.93
.527	131.8	4.39	.479	119.8	3.99	2¼	3	3½	**3**	**4**	**4½**	.436	108.9	3.63	.396	99.0	3.30
.586	146.4	4.88	.532	133.1	4.44	2½	3½	4	**3**	**4**	**4½**	.484	120.0	4.03	.440	110.0	3.67
.703	175.7	5.86	.639	159.7	5.32	3	4	4½	**3½**	**4½**	**6**	.581	145.2	4.84	.528	132.0	4.40
.820	205.0	6.83	.745	186.3	6.21	3½	4½	6	**4**	**5**	**6**	.678	169.4	5.65	.616	154.0	5.13
.937	234.3	7.81	.852	213.0	7.10	4	5	6	**4½**	**6**	**7**	.774	193.6	6.45	.704	176.0	5.87
1.05	263.5	8.78	.958	239.6	7.99	4½	6	7	**5**	**7**	**8**	.871	217.8	7.26	.792	198.0	6.60
1.17	292.8	9.76	1.06	266.2	8.87	5	7	8	**5**	**7**	**8**	.968	242.0	8.07	.880	220.0	7.33
1.41	351.4	11.7	1.28	319.4	10.6	6	8	9	**6**	**8**	**9**	1.16	290.4	9.68	1.06	264.0	8.80
1.64	409.9	13.7	1.49	372.7	12.4	7	9	11	**7**	**9**	**11**	1.36	338.8	11.3	1.23	308.0	10.3
1.87	468.5	15.6	1.70	425.9	14.2	8	10	12	**8**	**10**	**12**	1.55	387.2	12.9	1.41	352.0	11.7
2.11	527.1	17.6	1.92	479.2	16.0	9	12	14	**9**	**12**	**14**	1.74	435.6	14.5	1.58	396.0	13.2
2.34	585.6	19.5	2.13	532.4	17.7	10	12½	15	**10**	**12½**	**15**	1.94	484.0	16.1	1.76	440.0	14.7
2.93	732.0	24.4	2.66	665.5	22.2	12½	16	19	**12½**	**16**	**19**	2.42	605.0	20.2	2.20	550.0	18.3
3.51	878.5	29.3	3.19	798.6	26.6	15	19	23	**15**	**19**	**23**	2.90	726.0	24.2	2.64	660.0	22.0
4.10	1025.	34.2	3.73	931.7	31.1	17½	22	27	**17½**	**22**	**27**	3.39	847.0	28.2	3.08	770.0	25.7
4.69	1171.	39.0	4.26	1065.	35.5	20	25	30	**20**	**25**	**30**	3.87	968.0	32.3	3.52	880.0	29.3
5.86	1464.	48.8	5.32	1331.	44.4	25	32	38	**25**	**32**	**38**	4.84	1210.	40.3	4.40	1100.	36.7
7.03	1757.	58.6	6.39	1597.	53.2	30	38	45	**30**	**38**	**45**	5.81	1452.	48.4	5.28	1320.	44.0
8.20	2050.	68.3	7.45	1863.	62.1	35	44	53	**35**	**44**	**53**	6.78	1694.	56.5	6.16	1540.	51.3
9.37	2343.	78.1	8.52	2130.	71.0	40	50	60	**40**	**50**	**60**	7.74	1936.	64.5	7.04	1760.	58.7
10.5	2635.	87.8	9.58	2396.	79.9	45	57	68	**45**	**57**	**68**	8.71	2178.	72.6	7.92	1980.	66.0
11.7	2928.	97.6	10.6	2662.	88.7	50	63	75	**50**	**63**	**75**	9.68	2420.	80.7	8.80	2200.	73.3
14.1	3514.	117.	12.8	3194.	106.	60	75	90	**60**	**75**	**90**	11.6	2904.	96.8	10.6	2640.	88.0
16.4	4099.	137.	14.9	3727.	124.	70	88	105	**70**	**88**	**105**	13.6	3388.	113.	12.3	3080.	103.
18.7	4685.	156.	17.0	4259.	142.	80	100	120	**80**	**100**	**120**	15.5	3872.	129.	14.1	3520.	117.
21.1	5271.	176.	19.2	4792.	160.	90	113	135	**90**	**113**	**135**	17.4	4356.	145.	15.8	3960.	132.
23.4	5856.	195.	21.3	5324.	177.	100	125	150	**100**	**125**	**150**	19.4	4840.	161.	17.6	4400.	147.
25.8	6442.	215.	23.4	5856.	195.	110	138	165	**110**	**138**	**165**	21.3	5324.	177.	19.4	4840.	161.
28.1	7028.	234.	25.6	6389.	213.	120	150	180	**120**	**150**	**180**	23.2	5808.	194.	21.1	5280.	176.
30.5	7613.	254.	27.7	6921.	231.	130	163	195	**130**	**163**	**195**	25.2	6292.	210.	22.9	5720.	191.
32.8	8199.	273.	29.8	7454.	248.	140	175	210	**140**	**175**	**210**	27.1	6776.	226.	24.6	6160.	205.
35.1	8785.	293.	31.9	7986.	266.	150	188	225	**150**	**188**	**225**	29.0	7260.	242.	26.4	6600.	220.
37.5	9370.	312.	34.1	8518.	284.	160	200	240	**160**	**200**	**240**	31.0	7744.	258.	28.2	7040.	235.
39.8	9956.	332.	36.2	9051.	302.	170	213	255	**170**	**213**	**255**	32.9	8228.	274.	29.9	7480.	249.
42.2	10541	351.	38.3	9583.	319.	180	225	270	**180**	**225**	**270**	34.8	8712.	290.	31.7	7920.	264.
44.5	11127	371.	40.5	10116	337.	190	238	285	**190**	**238**	**285**	36.8	9196.	307.	33.4	8360.	279.
46.9	11713	390.	42.6	10648	355.	200	250	300	**200**	**250**	**300**	38.7	9680.	323.	35.2	8800.	293.

Pile Height Modifications for Cubic System

PILE HEIGHT	ADVANCE	PILE HEIGHT	ADVANCE
7.96 or over	None	4.50 to 4.93	6 Classes
7.24 to 7.95	1 Class	4.09 " 4.49	7 "
6.58 " 7.23	2 Classes	3.72 " 4.08	8 "
5.98 " 6.57	3 "	3.38 " 3.71	9 "
5.44 " 5.97	4 "	3.07 " 3.37	10 "
4.94 " 5.43	5 "	2.79 " 3.06	11 "

NOTE.—For less than 1/10 lot unit quantity and I. P. D. double the storage and handling rate of lot unit quantity.

PACKAGE RATE TABLE

FOR INDEX, FLOOR-LOAD AND CUBIC SYSTEMS

If Base Is	This Class Is
16.21	k–
14.74	j–
12.18	g–
10.07	e–
7.56	b–
6.25	A

If Base Is	This Class Is
16.21	j–
14.74	h–
12.18	f–
10.07	d–
7.56	a–
6.25	B

Storage Classes

If Base Is	This Class Is
16.21	h–
14.74	g–
12.18	e–
10.07	c–
7.56	A
6.25	C

If Base Is	This Class Is
16.21	g–
14.74	f–
12.18	d-
10.07	b–
7.56	B
6.25	D

Cts. per Sq. Ft. 6.25	Cts. per Cwt. 2.50	Cts. per Cu. Ft. .75	Cts. per Sq. Ft. 6.87	Cts. per Cwt. 2.75	Cts. per Cu. Ft. .82	RATES CENTS PER PACKAGE						Cts. per Sq. Ft. 7.56	Cts. per Cwt. 3.02	Cts. per Cu. Ft. .91	Cts. per Sq. Ft. 8.32	Cts. per Cwt. 3.33	Cts. per Cu. Ft. 1.00
						Storage			Handling								
Index	Wt. Limit	Cubic	Index	Wt. Limit	Cubic	L. U.	1/3 L. U.	1/10 L. U.	L. U.	1/3 L. U.	1/10 L. U.	Index	Wt. Limit	Cubic	Index	Wt. Limit	Cubic
0.80	20	.667	.073	18.2	.606	½	¾	1	1	1¼	1½	.066	16.5	.551	.060	15.0	.501
.120	30	1.00	.109	27.3	.909	¾	1	1¼	1½	2	2¼	.099	24.8	.826	.090	22.5	.751
.160	40	1.33	.145	36.4	1.21	1	1¼	1½	1½	2	2¼	.132	33.1	1.10	.120	30.1	1.00
.200	50	1.67	.182	45.5	1.52	1¼	1¾	2	2	2½	3	.165	41.3	1.38	.150	37.6	1.25
.240	60	2.00	.218	54.5	1.82	1½	2	2¼	2	2½	3	.198	49.6	1.65	.180	45.1	1.50
.280	70	2.33	.255	63.6	2.12	1¾	2¼	3	2½	3	4	.231	57.9	1.93	.210	52.6	1.75
.320	80	2.67	.291	72.7	2.42	2	2½	3	2½	3	4	.264	66.1	2.20	.240	60.1	2.00
.360	90	3.00	.327	81.8	2.73	2¼	3	3½	3	4	4½	.298	74.4	2.48	.270	67.6	2.25
.400	100	3.33	.364	90.9	3.03	2½	3½	4	3	4	4½	.331	82.6	2.75	.301	75.1	2.50
.480	120	4.00	.436	109.1	3.64	3	4	4½	3½	4½	6	.397	99.2	3.31	.361	90.2	3.01
.560	140	4.67	.509	127.3	4.24	3½	4½	6	4	5	6	.463	115.7	3.86	.421	105.2	3.51
.640	160	5.33	.582	145.5	4.85	4	5	6	4½	6	7	.529	132.2	4.41	.481	120.2	4.01
.720	180	6.00	.655	163.6	5.45	4½	6	7	5	7	8	.595	148.8	4.96	.541	135.2	4.51
.800	200	6.67	.727	181.8	6.06	5	7	8	5	7	8	.661	165.3	5.51	.601	150.3	5.01
.960	240	8.00	.873	218.2	7.27	6	8	9	6	8	9	.793	198.3	6.61	.721	180.3	6.01
1.12	280	9.33	1.02	254.5	8.48	7	9	11	7	9	11	.926	231.4	7.71	.841	210.4	7.01
1.28	320	10.7	1.16	290.9	9.70	8	10	12	8	10	12	1.06	264.5	8.82	.962	240.4	8.01
1.44	360	12.0	1.31	327.3	10.9	9	12	14	9	12	14	1.19	297.5	9.92	1.08	270.5	9.02
1.60	400	13.3	1.45	363.6	12.1	10	12½	15	10	12½	15	1.32	330.6	11.0	1.20	300.5	10.0
2.00	500	16.7	1.82	454.5	15.2	12½	16	19	12½	16	19	1.65	413.2	13.8	1.50	375.7	12.5
2.40	600	20.0	2.18	545.5	18.2	15	19	23	15	19	23	1.98	495.9	16.5	1.80	450.8	15.0
2.80	700	23.3	2.55	636.4	21.2	17½	22	27	17½	22	27	2.31	578.5	19.3	2.10	525.9	17.5
3.20	800	26.7	2.91	727.3	24.2	20	25	30	20	25	30	2.64	661.2	22.0	2.40	601.1	20.0
4.00	1000	33.3	3.64	909.1	30.3	25	32	38	25	32	38	3.31	826.4	27.5	3.01	751.3	25.0
4.80	1200	40.0	4.36	1091.	36.4	30	38	45	30	38	45	3.97	991.7	33.1	3.61	901.6	30.1
5.60	1400	46.7	5.09	1273.	42.4	35	44	53	35	44	53	4.63	1157.	38.6	4.21	1052.	35.1
6.40	1600	53.3	5.82	1455.	48.5	40	50	60	40	50	60	5.29	1322.	44.1	4.81	1202.	40.1
7.20	1800	60.0	6.55	1636.	54.5	45	57	68	45	57	68	5.95	1488.	49.6	5.41	1352.	45.1
8.00	2000	66.7	7.27	1818.	60.6	50	63	75	50	63	75	6.61	1653.	55.1	6.01	1503.	50.1
9.60	2400	80.0	8.73	2182.	72.7	60	75	90	60	75	90	7.93	1983.	66.1	7.21	1803.	60.1
11.2	2800	93.3	10.2	2545.	84.8	70	88	105	70	88	105	9.26	2314.	77.1	8.41	2104.	70.1
12.8	3200	107.	11.6	2909.	97.0	80	100	120	80	100	120	10.6	2645.	88.2	9.62	2404.	80.1
14.4	3600	120.	13.1	3273.	109.	90	113	135	90	113	135	11.9	2975.	99.2	10.8	2705.	90.2
16.0	4000	133.	14.5	3636.	121.	100	125	150	100	125	150	13.2	3306.	110.	12.0	3005.	100.
17.6	4400	147.	16.0	4000.	133.	110	138	165	110	138	165	14.5	3636.	121.	13.2	3306.	110.
19.2	4800	160.	17.5	4364.	145.	120	150	180	120	150	180	15.9	3967.	132.	14.4	3606.	120.
20.8	5200	173.	18.9	4727.	158.	130	163	195	130	163	195	17.2	4298.	143.	15.6	3907.	130.
22.4	5600	187.	20.4	5091.	170.	140	175	210	140	175	210	18.5	4628.	154.	16.8	4207.	140.
24.0	6000	200.	21.8	5455.	182.	150	188	225	150	188	225	19.8	4959.	165.	18.0	4508.	150.
25.6	6400	213.	23.3	5818.	194.	160	200	240	160	200	240	21.2	5289.	176.	19.2	4808.	160.
27.2	6800	227.	24.7	6182.	206.	170	213	255	170	213	255	22.5	5620.	187.	20.4	5109.	170.
28.8	7200	240.	26.2	6545.	218.	180	225	270	180	225	270	23.8	5950.	198.	21.6	5409.	180.
30.4	7600	253.	27.6	6909.	230.	190	238	285	190	238	285	25.1	6281.	209.	22.8	5710.	190.
32.0	8000	267.	29.1	7273.	242.	200	250	300	200	250	300	26.4	6612.	220.	24.0	6011.	200.

Pile Height Modifications for Cubic System

PILE HEIGHT	ADVANCE	PILE HEIGHT	ADVANCE
7.96 or over	None	4.50 to 4.93	6 Classes
7.24 to 7.95	1 Class	4.09 " 4.49	7 "
6.58 " 7.23	2 Classes	3.72 " 4.08	8 "
5.98 " 6.57	3 "	3.38 " 3.71	9 "
5.44 " 5.97	4 "	3.07 " 3.37	10 "
4.94 " 5.43	5 "	2.79 " 3.06	11 "

NOTE.—For less than 1/10 lot unit quantity and I. P. D. double the storage and handling rate of lot unit quantity.

PACKAGE RATE TABLE

FOR INDEX, FLOOR-LOAD AND CUBIC SYSTEMS

If Base Is	This Class Is	If Base Is	This Class Is	Storage Classes	If Base Is	This Class Is	If Base Is	This Class Is
16.21	f-	16.21	e-		16.21	d-	16.21	c-
14.74	e-	14.74	d-		14.74	c-	14.74	b-
12.18	c-	12.18	b-		12.18	a-	12.18	A
10.07	a-	10.07	A		10.07	B	10.07	C
7.56	C	7.56	D		7.56	E	7.56	F
6.25	E	6.25	F		6.25	G	6.25	H

Cts. per Sq. Ft. 9.15	Cts. per Cwt. 3.66	Cts. per Cu. Ft. 1.10	Cts. per Sq. Ft. 10.07	Cts. per Cwt. 4.03	Cts. per Cu. Ft. 1.21	RATES						Cts. per Sq. Ft. 11.07	Cts. per Cwt. 4.43	Cts. per Cu. Ft. 1.33	Cts. per Sq. Ft. 12.18	Cts. per Cwt. 4.87	Cts. per Cu. Ft. 1.46
						CENTS PER PACKAGE											
						Storage			Handling								
Index	Wt. Limit	Cubic	Index	Wt. Limit	Cubic	L. U.	1/3 L. U.	1/10 L. U.	L. U.	1/3 L. U.	1/10 L. U.	Index	Wt. Limit	Cubic	Index	Wt. Limit	Cubic
.055	13.7	.455	.050	12.4	.414	½	¾	1	**1**	**1¼**	**1½**	.045	11.3	.376	.041	10.3	.342
.082	20.5	.683	.075	18.6	.621	¾	1	1¼	**1½**	**2**	**2¼**	.068	16.9	.564	.062	15.4	.513
.109	27.3	.911	.099	24.8	.828	1	1¼	1½	**1½**	**2**	**2¼**	.090	22.6	.753	.082	20.5	.684
.137	34.2	1.14	.124	31.0	1.03	1¼	1¾	2	**2**	**2½**	**3**	.113	28.2	.941	.103	25.7	.855
.164	41.0	1.37	.149	37.3	1.24	1½	2	2¼	**2**	**2½**	**3**	.135	33.9	1.13	.123	30.8	1.03
.191	47.8	1.59	.174	43.5	1.45	1¾	2¼	3	**2½**	**3**	**4**	.158	39.5	1.32	.144	35.9	1.20
.219	54.6	1.82	.199	49.7	1.66	2	2½	3	**2½**	**3**	**4**	.181	45.2	1.51	.164	41.1	1.37
.246	61.5	2.05	.224	55.9	1.86	2¼	3	3½	**3**	**4**	**4½**	.203	50.8	1.69	.185	46.2	1.54
.273	68.3	2.28	.248	62.1	2.07	2½	3½	4	**3**	**4**	**4½**	.226	56.4	1.88	.205	51.3	1.71
.328	82.0	2.73	.298	74.5	2.48	3	4	4½	**3½**	**4½**	**6**	.271	67.7	2.26	.246	61.6	2.05
.382	95.6	3.19	.348	86.9	2.90	3½	4½	6	**4**	**5**	**6**	.316	79.0	2.63	.287	71.8	2.39
.437	109.3	3.64	.397	99.3	3.31	4	5	6	**4½**	**6**	**7**	.361	90.3	3.01	.328	82.1	2.74
.492	122.9	4.10	.447	111.8	3.73	4½	6	7	**5**	**7**	**8**	.406	101.6	3.39	.369	92.4	3.08
.546	136.6	4.55	.497	124.2	4.14	5	7	8	**5**	**7**	**8**	.452	112.9	3.76	.411	102.6	3.42
.656	163.9	5.46	.596	149.0	4.97	6	8	9	**6**	**8**	**9**	.542	135.5	4.52	.493	123.2	4.11
.765	191.2	6.37	.695	173.9	5.80	7	9	11	**7**	**9**	**11**	.632	158.1	5.27	.575	143.7	4.79
.874	218.6	7.29	.795	198.7	6.62	8	10	12	**8**	**10**	**12**	.723	180.6	6.02	.657	164.2	5.47
.984	245.9	8.20	.894	223.5	7.45	9	12	14	**9**	**12**	**14**	.813	203.2	6.77	.739	184.7	6.16
1.09	273.2	9.11	.993	248.4	8.28	10	12½	15	**10**	**12½**	**15**	.903	225.8	7.53	.821	205.3	6.84
1.37	341.5	11.4	1.24	310.5	10.3	12½	16	19	**12½**	**16**	**19**	1.13	282.2	9.41	1.03	256.6	8.55
1.64	409.8	13.7	1.49	372.6	12.4	15	19	23	**15**	**19**	**23**	1.35	338.7	11.3	1.23	307.9	10.3
1.91	478.1	15.9	1.74	434.6	14.5	17½	22	27	**17½**	**22**	**27**	1.58	395.1	13.2	1.44	359.2	12.0
2.19	546.4	18.2	1.99	496.7	16.6	20	25	30	**20**	**25**	**30**	1.81	451.6	15.1	1.64	410.5	13.7
2.73	683.0	22.8	2.48	620.9	20.7	25	32	38	**25**	**32**	**38**	2.26	564.5	18.8	2.05	513.2	17.1
3.28	819.6	27.3	2.98	745.1	24.8	30	38	45	**30**	**38**	**45**	2.71	677.4	22.6	2.46	615.8	20.5
3.82	956.2	31.9	3.48	869.3	29.0	35	44	53	**35**	**44**	**53**	3.16	790.3	26.3	2.87	718.4	23.9
4.37	1093.	36.4	3.97	993.5	33.1	40	50	60	**40**	**50**	**60**	3.61	903.2	30.1	3.28	821.1	27.4
4.92	1229.	41.0	4.47	1118.	37.3	45	57	68	**45**	**57**	**68**	4.06	1016.	33.9	3.69	923.7	30.8
5.46	1366.	45.5	4.97	1242.	41.4	50	63	75	**50**	**63**	**75**	4.52	1129.	37.6	4.11	1026.	34.2
6.56	1639.	54.6	5.96	1490.	49.7	60	75	90	**60**	**75**	**90**	5.42	1355.	45.2	4.93	1232.	41.1
7.65	1912.	63.7	6.95	1739.	58.0	70	88	105	**70**	**88**	**105**	6.32	1581.	52.7	5.75	1437.	47.9
8.74	2186.	72.9	7.95	1987.	66.2	80	100	120	**80**	**100**	**120**	7.23	1806.	60.2	6.57	1642.	54.7
9.84	2459.	82.0	8.94	2235.	74.5	90	113	135	**90**	**113**	**135**	8.13	2032.	67.7	7.39	1847.	61.6
10.9	2732.	91.1	9.93	2484.	82.8	100	125	150	**100**	**125**	**150**	9.03	2258.	75.3	8.21	2053.	68.4
12.0	3005.	100.	10.9	2732.	91.1	110	138	165	**110**	**138**	**165**	9.93	2484.	82.8	9.03	2258.	75.3
13.1	3278.	109.	11.9	2980.	99.3	120	150	180	**120**	**150**	**180**	10.8	2709.	90.3	9.85	2463.	82.1
14.2	3552.	118.	12.9	3229.	108.	130	163	195	**130**	**163**	**195**	11.7	2935.	97.8	10.7	2668.	88.9
15.3	3825.	127.	13.9	3477.	116.	140	175	210	**140**	**175**	**210**	12.6	3161.	105.	11.5	2874.	95.8
16.4	4098.	137.	14.9	3726.	124.	150	188	225	**150**	**188**	**225**	13.5	3387.	113.	12.3	3079.	103.
17.5	4371.	146.	15.9	3974.	132.	160	200	240	**160**	**200**	**240**	14.5	3613.	120.	13.1	3284.	109.
18.6	4644.	155.	16.9	4222.	141.	170	213	255	**170**	**213**	**255**	15.4	3838.	128.	14.0	3489.	116.
19.7	4918.	164.	17.9	4471.	149.	180	225	270	**180**	**225**	**270**	16.3	4064.	135.	14.8	3695.	123.
20.8	5191.	173.	18.9	4719.	157.	190	238	285	**190**	**238**	**285**	17.2	4290.	143.	15.6	3900.	130.
21.9	5464.	182.	19.9	4967.	166.	200	250	300	**200**	**250**	**300**	18.1	4516.	151.	16.4	4105.	137.

Pile Height Modifications for Cubic System

PILE HEIGHT	ADVANCE	PILE HEIGHT	ADVANCE
7.96 or over	None	4.50 to 4.93	6 Classes
7.24 to 7.95	1 Class	4.09 " 4.49	7 "
6.58 " 7.23	2 Classes	3.72 " 4.08	8 "
5.98 " 6.57	3 "	3.38 " 3.71	9 "
5.44 " 5.97	4 "	3.07 " 3.37	10 "
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FOR INDEX, FLOOR-LOAD AND CUBIC SYSTEMS

If Base Is	This Class Is	If Base Is	This Class Is	Storage Classes	If Base Is	This Class Is	If Base Is	This Class Is
16.21	b-	**16.21**	a-		**16.21**	A	**16.21**	B
14.74	a-	14.74	A		14.74	B	14.74	C
12.18	B	12.18	C		12.18	D	12.18	E
10.07	D	10.07	E		10.07	F	10.07	G
7.56	G	7.56	H		7.56	J	7.56	K
6.25	J	6.25	K		6.25	L	6.25	M

Cts. per Sq. Ft. 13.40	Cts. per Cwt. 5.36	Cts. per Cu. Ft. 1.61	Cts. per Sq. Ft. 14.74	Cts. per Cwt. 5.89	Cts. per Cu. Ft. 1.77	RATES — CENTS PER PACKAGE						Cts. per Sq. Ft. 16.21	Cts. per Cwt. 6.48	Cts. per Cu. Ft. 1.95	Cts. per Sq. Ft. 17.83	Cts. per Cwt.	Cts. per Cu. Ft. 2.14
						Storage			Handling								
Index	Wt. Limit	Cubic	Index	Wt. Limit	Cubic	L. U.	1/3 L. U.	1/10 L. U.	L. U.	1/3 L. U.	1/10 L. U.	Index	Wt. Limit	Cubic	Index	Wt. Limit	Cubic
.037	9.3	.311	.034	8.5	.283	½	¾	1	**1**	**1¼**	**1½**	.031	7.7	.257	.028	7.0	.234
.056	14.0	.467	.051	12.7	.424	¾	1	1¼	**1½**	**2**	**2¼**	.046	11.6	.386	.042	10.5	.350
.075	18.7	.622	.068	17.0	.565	1	1¼	1½	**1½**	**2**	**2¼**	.062	15.4	.514	.056	14.0	.467
.093	23.3	.778	.085	21.2	.707	1¼	1¾	2	**2**	**2½**	**3**	.077	19.3	.643	.070	17.5	.584
.112	28.0	.933	.102	25.4	.848	1½	2	2¼	**2**	**2½**	**3**	.093	23.1	.771	.084	21.0	.701
.131	32.7	1.09	.119	29.7	.990	1¾	2¼	3	**2½**	**3**	**4**	.108	27.0	.900	.098	24.5	.818
.149	37.3	1.24	.136	33.9	1.13	2	2½	3	**2½**	**3**	**4**	.123	30.8	1.03	.112	28.0	.935
.168	42.0	1.40	.153	38.2	1.27	2¼	3	3½	**3**	**4**	**4½**	.139	34.7	1.16	.126	31.5	1.05
.187	46.7	1.56	.170	42.4	1.41	2½	3½	4	**3**	**4**	**4½**	.154	38.6	1.29	.140	35.0	1.17
.224	56.0	1.87	.204	50.9	1.70	3	4	4½	**3½**	**4½**	**6**	.185	46.3	1.54	.168	42.1	1.40
.261	65.3	2.18	.237	59.4	1.98	3½	4½	6	**4**	**5**	**6**	.216	54.0	1.80	.196	49.1	1.64
.299	74.6	2.49	.271	67.9	2.26	4	5	6	**4½**	**6**	**7**	.247	61.7	2.06	.224	56.1	1.87
.336	84.0	2.80	.305	76.3	2.54	4½	6	7	**5**	**7**	**8**	.278	69.4	2.31	.252	63.1	2.10
.373	93.3	3.11	.339	84.8	2.83	5	7	8	**5**	**7**	**8**	.308	77.1	2.57	.280	70.1	2.34
.448	112.0	3.73	.407	101.8	3.39	6	8	9	**6**	**8**	**9**	.370	92.5	3.08	.336	84.1	2.80
.522	130.6	4.35	.475	118.7	3.96	7	9	11	**7**	**9**	**11**	.432	108.0	3.60	.393	98.1	3.27
.597	149.3	4.98	.543	135.7	4.52	8	10	12	**8**	**10**	**12**	.493	123.4	4.11	.449	112.2	3.74
.672	167.9	5.60	.611	152.7	5.09	9	12	14	**9**	**12**	**14**	.555	138.8	4.63	.505	126.2	4.21
.746	186.6	6.22	.679	169.6	5.65	10	12½	15	**10**	**12½**	**15**	.617	154.2	5.14	.561	140.2	4.67
.933	233.3	7.78	.848	212.0	7.07	12½	16	19	**12½**	**16**	**19**	.771	192.8	6.43	.701	175.2	5.84
1.12	279.9	9.33	1.02	254.5	8.48	15	19	23	**15**	**19**	**23**	.925	231.3	7.71	.841	210.3	7.01
1.31	326.6	10.9	1.19	296.9	9.90	17½	22	27	**17½**	**22**	**27**	1.08	269.9	9.00	.981	245.3	8.18
1.49	373.2	12.4	1.36	339.3	11.3	20	25	30	**20**	**25**	**30**	1.23	308.4	10.3	1.12	280.4	9.35
1.87	466.5	15.6	1.70	424.1	14.1	25	32	38	**25**	**32**	**38**	1.54	385.5	12.9	1.40	350.5	11.7
2.24	559.8	18.7	2.04	508.9	17.0	30	38	45	**30**	**38**	**45**	1.85	462.7	15.4	1.68	420.6	14.0
2.61	653.1	21.8	2.37	593.7	19.8	35	44	53	**35**	**44**	**53**	2.16	539.8	18.0	1.96	490.7	16.4
2.99	746.4	24.9	2.71	678.6	22.6	40	50	60	**40**	**50**	**60**	2.47	616.9	20.6	2.24	560.8	18.7
3.36	839.7	28.0	3.05	763.4	25.4	45	57	68	**45**	**57**	**68**	2.78	694.0	23.1	2.52	630.9	21.0
3.73	933.0	31.1	3.39	848.2	28.3	50	63	75	**50**	**63**	**75**	3.08	771.1	25.7	2.80	701.0	23.4
4.48	1120.	37.3	4.07	1018.	33.9	60	75	90	**60**	**75**	**90**	3.70	925.3	30.8	3.36	841.2	28.0
5.22	1306.	43.5	4.75	1187.	39.6	70	88	105	**70**	**88**	**105**	4.32	1080.	36.0	3.93	981.4	32.7
5.97	1493.	49.8	5.43	1357.	45.2	80	100	120	**80**	**100**	**120**	4.93	1234.	41.1	4.49	1122.	37.4
6.72	1679.	56.0	6.11	1527.	50.9	90	113	135	**90**	**113**	**135**	5.55	1388.	46.3	5.05	1262.	42.1
7.46	1866.	62.2	6.79	1696.	56.5	100	125	150	**100**	**125**	**150**	6.17	1542.	51.4	5.61	1402.	46.7
8.21	2053.	68.4	7.46	1866.	62.2	110	138	165	**110**	**138**	**165**	6.79	1696.	56.5	6.17	1542.	51.4
8.96	2239.	74.6	8.14	2036.	67.9	120	150	180	**120**	**150**	**180**	7.40	1851.	61.7	6.73	1682.	56.1
9.70	2426.	80.9	8.82	2205.	73.5	130	163	195	**130**	**163**	**195**	8.02	2005.	66.8	7.29	1823.	60.8
10.5	2612.	87.1	9.50	2375.	79.2	140	175	210	**140**	**175**	**210**	8.64	2159.	72.0	7.85	1963.	65.4
11.2	2799.	93.3	10.2	2545.	84.8	150	188	225	**150**	**188**	**225**	9.25	2313.	77.1	8.41	2103.	70.1
11.9	2986.	99.5	10.9	2714.	90.5	160	200	240	**160**	**200**	**240**	9.87	2467.	82.2	8.97	2243.	74.8
12.7	3172.	106.	11.5	2884.	96.1	170	213	255	**170**	**213**	**255**	10.5	2622.	87.4	9.53	2383.	79.4
13.4	3359.	112.	12.2	3054.	102.	180	225	270	**180**	**225**	**270**	11.1	2776.	92.5	10.1	2554.	84.1
14.2	3545.	118.	12.9	3223.	107.	190	238	285	**190**	**238**	**285**	11.7	2930.	97.7	10.7	2664.	88.8
14.9	3732.	124.	13.6	3393.	113.	200	250	300	**200**	**250**	**300**	12.3	3084.	103.	11.2	2804.	93.5

Pile Height Modifications for Cubic System

PILE HEIGHT	ADVANCE	PILE HEIGHT	ADVANCE
7.96 or over	None	4.50 to 4.93	6 Classes
7.24 to 7.95	1 Class	4.09 " 4.49	7 "
6.58 " 7.23	2 Classes	3.72 " 4.08	8 "
5.98 " 6.57	3 "	3.38 " 3.71	9 "
5.44 " 5.97	4 "	3.07 " 3.37	10 "
4.94 " 5.43	5 "	2.79 " 3.06	11 "

NOTE.—For less than 1/10 lot unit quantity and I. P. D. double the storage and handling rate of lot unit quantity.

PACKAGE RATE TABLE

FOR INDEX, FLOOR-LOAD AND CUBIC SYSTEMS

If Base Is	This Class Is
16.21	C
14.74	D
12.18	F
10.07	H
7.56	L
6.25	N

If Base Is	This Class Is
16.21	D
14.74	E
12.18	G
10.07	J
7.56	M
6.25	O

Storage Classes

If Base Is	This Class Is
16.21	E
14.74	F
12.18	H
10.07	K
7.56	N
6.25	P

If Base Is	This Class Is
16.21	F
14.74	G
12.18	J
10.07	L
7.56	O
6.25	Q

Cts. per Sq. Ft. 19.62	Cts. per Cwt. 7.85	Cts. per Cu. Ft. 2.35	Cts. per Sq. Ft. 21.58	Cts. per Cwt. 8.63	Cts. per Cu. Ft. 2.59	RATES CENTS PER PACKAGE						Cts. per Sq. Ft. 23.73	Cts. per Cwt. 9.49	Cts. per Cu. Ft. 2.85	Cts. per Sq. Ft. 26.11	Cts. per Cwt. 10.4	Cts. per Cu. Ft. 3.13
						Storage			Handling								
Index	Wt. Limit	Cubic	Index	Wt. Limit	Cubic	L. U.	1/3 L. U.	1/10 L. U.	L. U.	1/3 L. U.	1/10 L. U.	Index	Wt. Limit	Cubic	Index	Wt. Limit	Cubic
.025	6.4	.212	.023	5.8	.193	½	¾	1	**1**	**1¼**	**1½**	.021	5.3	.176	.019	4.8	.160
.038	9.6	.319	.035	8.7	.290	¾	1	1¼	**1½**	**2**	**2¼**	.032	7.9	.263	.029	7.2	.239
.051	12.7	.425	.046	11.6	.386	1	1¼	1½	**1½**	**2**	**2¼**	.042	10.5	.351	.038	9.6	.319
.064	15.9	.531	.058	14.5	.483	1¼	1¾	2	**2**	**2½**	**3**	.053	13.2	.439	.048	12.0	.399
.076	19.1	.637	.070	17.4	.579	1½	2	2¼	**2**	**2½**	**3**	.063	15.8	.527	.057	14.4	.479
.089	22.3	.743	.081	20.3	.676	1¾	2¼	3	**2½**	**3**	**4**	.074	18.4	.614	.067	16.8	.559
.102	25.5	.850	.093	23.2	.772	2	2½	3	**2½**	**3**	**4**	.084	21.1	.702	.077	19.2	.638
.115	28.7	.956	.104	26.1	.869	2¼	3	3½	**3**	**4**	**4½**	.095	23.7	.790	.086	21.5	.718
.127	31.9	1.06	.116	29.0	.966	2½	3½	4	**3**	**4**	**4½**	.105	26.3	.878	.096	23.9	.798
.153	38.2	1.27	.139	34.8	1.16	3	4	4½	**3½**	**4½**	**6**	.126	31.6	1.05	.115	28.7	.958
.178	44.6	1.49	.162	40.6	1.35	3½	4½	6	**4**	**5**	**6**	.147	36.9	1.23	.134	33.5	1.12
.204	51.0	1.70	.185	46.3	1.54	4	5	6	**4½**	**6**	**7**	.169	42.1	1.40	.153	38.3	1.28
.229	57.4	1.91	.209	52.1	1.74	4½	6	7	**5**	**7**	**8**	.190	47.4	1.58	.172	43.1	1.44
.255	63.7	2.12	.232	57.9	1.93	5	7	8	**5**	**7**	**8**	.211	52.7	1.76	.192	47.9	1.60
.306	76.5	2.55	.278	69.5	2.32	6	8	9	**6**	**8**	**9**	.253	63.2	2.11	.230	57.5	1.92
.357	89.2	2.97	.324	81.1	2.70	7	9	11	**7**	**9**	**11**	.295	73.7	2.46	.268	67.0	2.23
.408	102.0	3.40	.371	92.7	3.09	8	10	12	**8**	**10**	**12**	.337	84.3	2.81	.306	76.6	2.55
.459	114.7	3.82	.417	104.3	3.48	9	12	14	**9**	**12**	**14**	.379	94.8	3.16	.345	86.2	2.87
.510	127.5	4.25	.463	115.9	3.86	10	12½	15	**10**	**12½**	**15**	.421	105.3	3.51	.383	95.8	3.19
.637	159.3	5.31	.579	144.8	4.83	12½	16	19	**12½**	**16**	**19**	.527	131.7	4.39	.479	119.7	3.99
.765	191.2	6.37	.695	173.8	5.79	15	19	23	**15**	**19**	**23**	.632	158.0	5.27	.575	143.6	4.79
.892	223.0	7.43	.811	202.8	6.76	17½	22	27	**17½**	**22**	**27**	.737	184.3	6.14	.670	167.6	5.59
1.02	254.9	8.50	.927	231.7	7.72	20	25	30	**20**	**25**	**30**	.843	210.7	7.02	.766	191.5	6.38
1.27	318.6	10.6	1.16	289.7	9.66	25	32	38	**25**	**32**	**38**	1.05	263.3	8.78	.958	239.4	7.98
1.53	382.4	12.7	1.39	347.6	11.6	30	38	45	**30**	**38**	**45**	1.26	316.0	10.5	1.15	287.3	9.58
1.78	446.1	14.9	1.62	405.5	13.5	35	44	53	**35**	**44**	**53**	1.47	368.7	12.3	1.34	335.1	11.2
2.04	509.8	17.0	1.85	463.5	15.4	40	50	60	**40**	**50**	**60**	1.69	421.3	14.0	1.53	383.0	12.8
2.29	573.5	19.1	2.09	521.4	17.4	45	57	68	**45**	**57**	**68**	1.90	474.0	15.8	1.72	430.9	14.4
2.55	637.3	21.2	2.32	579.3	19.3	50	63	75	**50**	**63**	**75**	2.11	526.7	17.6	1.92	478.8	16.0
3.06	764.7	25.5	2.78	695.2	23.2	60	75	90	**60**	**75**	**90**	2.53	632.0	21.1	2.30	574.5	19.2
3.57	892.2	29.7	3.24	811.1	27.0	70	88	105	**70**	**88**	**105**	2.95	737.3	24.6	2.68	670.3	22.3
4.08	1020.	34.0	3.71	926.9	30.9	80	100	120	**80**	**100**	**120**	3.37	842.7	28.1	3.06	766.1	25.5
4.59	1147.	38.2	4.17	1043.	34.8	90	113	135	**90**	**113**	**135**	3.79	948.0	31.6	3.45	861.8	28.7
5.10	1275.	42.5	4.63	1159.	38.6	100	125	150	**100**	**125**	**150**	4.21	1053.	35.1	3.83	957.6	31.9
5.61	1402.	46.7	5.10	1275.	42.5	110	138	165	**110**	**138**	**165**	4.63	1159.	38.6	4.21	1053.	35.1
6.12	1529.	51.0	5.56	1390.	46.3	120	150	180	**120**	**150**	**180**	5.06	1264.	42.1	4.60	1149.	38.3
6.63	1657.	55.2	6.03	1506.	50.2	130	163	195	**130**	**163**	**195**	5.48	1369.	45.6	4.98	1245.	41.5
7.14	1784.	59.5	6.49	1622.	54.1	140	175	210	**140**	**175**	**210**	5.90	1475.	49.2	5.36	1341.	44.7
7.65	1912.	63.7	6.95	1738.	57.9	150	188	225	**150**	**188**	**225**	6.32	1580.	52.7	5.75	1436.	47.9
8.16	2039.	68.0	7.42	1854.	61.8	160	200	240	**160**	**200**	**240**	6.74	1685.	56.2	6.13	1532.	51.1
8.67	2167.	72.2	7.88	1970.	65.7	170	213	255	**170**	**213**	**255**	7.16	1791.	59.7	6.51	1628.	54.3
9.18	2294.	76.5	8.34	2086.	69.5	180	225	270	**180**	**225**	**270**	7.58	1896.	63.2	6.89	1724.	57.5
9.69	2422.	80.7	8.81	2201.	73.4	190	238	285	**190**	**238**	**285**	8.00	2001.	66.7	7.28	1819.	60.6
10.2	2549.	85.0	9.27	2317.	77.2	200	250	300	**200**	**250**	**300**	8.43	2107.	70.2	7.66	1915.	63.8

Pile Height Modifications for Cubic System

PILE HEIGHT	ADVANCE	PILE HEIGHT	ADVANCE
7.96 or over	None	4.50 to 4.93	6 Classes
7.24 to 7.95	1 Class	4.09 " 4.49	7 "
6.58 " 7.23	2 Classes	3.72 " 4.08	8 "
5.98 " 6.57	3 "	3.38 " 3.71	9 "
5.44 " 5.97	4 "	3.07 " 3.37	10 "
4.94 " 5.43	5 "	2.79 " 3.06	11 "

NOTE.—For less than 1/10 lot unit quantity and I. P. D. double the storage and handling rate of lot unit quantity.

PACKAGE RATE TABLE

EXTRA TABLES FOR FLOOR-LOAD SYSTEM

THESE STORAGE CLASSES ARE						IF BASE IS						THESE STORAGE CLASSES ARE					
G H K M P R	H J L N Q S	J K M O R T	K L N P S U	L M O Q T V	M N P R U W	16.21 14.74 12.18 10.07 7.56 6.25						N O Q S V X	O P R T W Y	P Q S U X Z	Q R T V Y Aa	R S U W Z Bb	S T V X Aa Cc
11.5	12.6	13.9	15.3	16.8	18.5	Cents per 100 lbs.						20.3	22.4	24.6	27.1	29.8	32.8
						CENTS PER PACKAGE											
						Storage			Handling								
						L. U.	1/3 L. U.	1/10 L. U.	L. U.	1/3 L. U.	1/10 L. U.						
4.4	4.0	3.6	3.3	3.0	2.7	½	¾	1	**1**	**1¼**	**1½**	2.5	2.2	2.0	1.8	1.7	1.5
6.5	5.9	5.4	4.9	4.5	4.1	¾	1	1¼	**1½**	**2**	**2¼**	3.7	3.4	3.0	2.8	2.5	2.3
8.7	7.9	7.2	6.5	5.9	5.4	1	1¼	1½	**1½**	**2**	**2¼**	4.9	4.5	4.1	3.7	3.4	3.1
10.9	9.9	9.0	8.2	7.4	6.8	1¼	1¾	2	**2**	**2½**	**3**	6.1	5.6	5.1	4.6	4.2	3.8
13.1	11.9	10.8	9.8	8.9	8.1	1½	2	2¼	**2**	**2½**	**3**	7.4	6.7	6.1	5.5	5.0	4.6
15.2	13.8	12.6	11.4	10.4	9.5	1¾	2¼	3	**2½**	**3**	**4**	8.6	7.8	7.1	6.5	5.9	5.3
17.4	15.8	14.4	13.1	11.9	10.8	2	2½	3	**2½**	**3**	**4**	9.8	8.9	8.1	7.4	6.7	6.1
19.6	17.8	16.2	14.7	13.4	12.2	2¼	3	3½	**3**	**4**	**4½**	11.1	10.1	9.1	8.3	7.6	6.9
21.8	19.8	18.0	16.4	14.9	13.5	2½	3½	4	**3**	**4**	**4½**	12.3	11.2	10.2	9.2	8.4	7.6
26.1	23.7	21.6	19.6	17.8	16.2	3	4	4½	**3½**	**4½**	**6**	14.7	13.4	12.2	11.1	10.1	9.2
30.5	27.7	25.2	22.9	20.8	18.9	3½	4½	6	**4**	**5**	**6**	17.2	15.6	14.2	12.9	11.7	10.7
34.8	31.7	28.8	26.2	23.8	21.6	4	5	6	**4½**	**6**	**7**	19.7	17.9	16.2	14.8	13.4	12.2
39.2	35.6	32.4	29.4	26.8	24.3	4½	6	7	**5**	**7**	**8**	22.1	20.1	18.3	16.6	15.1	13.7
43.5	39.6	36.0	32.7	29.7	27.0	5	7	8	**5**	**7**	**8**	24.6	22.3	20.3	18.5	16.8	15.3
52.2	47.5	43.2	39.2	35.7	32.4	6	8	9	**6**	**8**	**9**	29.5	26.8	24.4	22.2	20.1	18.3
60.9	55.4	50.4	45.8	41.6	37.8	7	9	11	**7**	**9**	**11**	34.4	31.3	28.4	25.8	23.5	21.4
69.6	63.3	57.6	52.3	47.6	43.2	8	10	12	**8**	**10**	**12**	39.3	35.7	32.5	29.5	26.8	24.4
78.3	71.2	64.7	58.9	53.5	48.6	9	12	14	**9**	**12**	**14**	44.2	40.2	36.5	33.2	30.2	27.5
87.1	79.1	71.9	65.4	59.5	54.1	10	12½	15	**10**	**12½**	**15**	49.1	44.7	40.6	36.9	33.6	30.5
108.8	98.9	89.9	81.8	74.3	67.6	12½	16	19	**12½**	**16**	**19**	61.4	55.8	50.8	46.1	42.0	38.1
130.6	118.7	107.9	98.1	89.2	81.1	15	19	23	**15**	**19**	**23**	73.7	67.0	60.9	55.4	50.3	45.8
152.3	138.5	125.9	114.5	104.1	94.6	17½	22	27	**17½**	**22**	**27**	86.0	78.2	71.1	64.6	58.7	53.4
174.1	158.3	143.9	130.8	118.9	108.1	20	25	30	**20**	**25**	**30**	98.3	89.3	81.2	73.8	67.1	61.0
217.6	197.8	179.9	163.5	148.6	135.1	25	32	38	**25**	**32**	**38**	122.8	111.7	101.5	92.3	83.9	76.3
261.2	237.4	215.8	196.2	178.4	162.2	30	38	45	**30**	**38**	**45**	147.4	134.0	121.8	110.8	100.7	91.5
304.7	277.0	251.8	228.9	208.1	189.2	35	44	53	**35**	**44**	**53**	172.0	156.3	142.1	129.2	117.5	106.8
348.2	316.6	287.8	261.6	237.8	216.2	40	50	60	**40**	**50**	**60**	196.6	178.7	162.4	147.7	134.2	122.0
391.7	356.1	323.7	294.3	267.6	243.2	45	57	68	**45**	**57**	**68**	221.1	201.0	182.7	166.1	151.0	137.3
435.3	395.7	359.7	327.0	297.3	270.3	50	63	75	**50**	**63**	**75**	245.7	223.4	203.1	184.6	167.8	152.6
522.3	474.8	431.7	392.4	356.7	324.3	60	75	90	**60**	**75**	**90**	294.8	268.0	243.7	221.5	201.4	183.1
609.4	554.0	503.6	457.8	416.2	378.4	70	88	105	**70**	**88**	**105**	344.0	312.7	284.3	258.4	234.9	213.6
696.4	633.1	575.5	523.2	475.7	432.4	80	100	120	**80**	**100**	**120**	393.1	357.4	324.9	295.3	268.5	244.1
783.5	712.2	647.5	588.6	535.1	486.5	90	113	135	**90**	**113**	**135**	442.2	402.0	365.5	332.3	302.1	274.6
870.5	791.4	719.4	654.0	594.6	540.5	100	125	150	**100**	**125**	**150**	491.4	446.7	406.1	369.2	335.6	305.1
957.6	870.5	791.4	719.4	654.0	594.6	110	138	165	**110**	**138**	**165**	540.5	491.4	446.7	406.1	369.2	335.6
1045.	949.7	863.3	784.8	713.5	648.6	120	150	180	**120**	**150**	**180**	589.7	536.1	487.3	443.0	402.7	366.1
1132.	1029.	935.3	850.2	772.9	702.7	130	163	195	**130**	**163**	**195**	638.8	580.7	527.9	479.9	436.3	396.6
1219.	1108.	1007.	915.6	832.4	756.7	140	175	210	**140**	**175**	**210**	687.9	625.4	568.5	516.9	469.9	427.2
1306.	1187.	1079.	981.0	891.9	810.8	150	188	225	**150**	**188**	**225**	737.1	670.1	609.2	553.8	503.4	457.7
1393.	1266.	1151.	1046.	951.3	864.8	160	200	240	**160**	**200**	**240**	786.2	714.7	649.8	590.7	537.0	488.2
1480.	1345.	1223.	1112.	1011.	918.9	170	213	255	**170**	**213**	**255**	835.4	759.4	690.4	627.6	570.6	518.7
1567.	1424.	1295.	1177.	1070.	972.9	180	225	270	**180**	**225**	**270**	884.5	804.1	731.0	664.5	604.1	549.2
1654.	1504.	1367.	1243.	1130.	1027.	190	238	285	**190**	**238**	**285**	933.6	848.8	771.6	701.4	637.7	579.7
1741.	1583.	1439.	1308.	1189.	1081.	200	250	300	**200**	**250**	**300**	982.8	893.4	812.2	738.4	671.2	610.2

NOTE.—For less than 1/10 lot unit quantity and I. P. D. double the storage and handling rate of lot unit quantity.

USEFUL FORMULAE

Applicable to Index, Floor-Load and Cubic Systems

A commodity in cases 2 feet × 1.6 feet × 1 foot and weighing 84 pounds each, to earn 16.21 cents per square foot.

A. INDEX METHOD:

$2 \times 1.6 = 3.2 + .16$ (5% loss in pile) = 3.36 feet pile surface.
3.36 divided by 8 (number of packages high) = .42 (Index).
$.42 \times 16.21 = 6.8082$ cents per package.
6.8082 × 100 divided by 84 = 8.105 cents per 100 pounds.

B. FLOOR-LOAD METHOD:

$2 \times 1.6 \times 1 = 3.2$ cubic feet package.
$3.2 + .16$ (5% loss in pile) = 3.36 cubic feet package in pile.
84 divided by 3.36 = 25 pounds per cubic foot package in pile.
25 × 8 (maximum practical pile height) = 200 pounds (Floor load).
16.21 × 100 divided by 200 = 8.105 cents per 100 pounds.
$\frac{84}{100} \times 8.105 = 6.8082$ cents per package.

C. CUBIC METHOD:

16.21 cents per square foot divided by 8 (practical pile height) = 2.02625 cents per cubic foot.
2.02625×3.36 (cubic feet package in pile) = 6.8082 cents per package.

From the above data may be evolved the following formulae:

1. Cubic feet package in pile $= \frac{\text{Package weight} \times \text{pile height}}{\text{Floor load}}$

   PROOF: $\frac{84 \times 8}{200} = 3.36$ (cubic feet package in pile).

2. Cubic feet package in pile = Index × pile height.
   PROOF: $.42 \times 8 = 3.36$ (cubic feet package in pile).

3. Cubic weight package in pile $= \frac{\text{Floor load}}{\text{Pile height}}$

   PROOF: $\frac{200}{8} = 25.0$ (cubic weight package in pile).

4. Cubic weight package in pile $= \frac{\text{Package weight}}{\text{Index} \times \text{pile height}}$

   PROOF: $\frac{84}{.42 \times 8} = 25.0$ (cubic weight package in pile).

5. Floor load $= \frac{\text{Package weight} \times \text{pile height}}{\text{Cubic feet package in pile}}$

   PROOF: $\frac{84 \times 8}{3.36} = 200$ (floor load).

6. Floor load $= \frac{\text{Package weight}}{\text{Index}}$

   PROOF: $\frac{84}{.42} = 200$ (floor load).

7. Index $= \frac{\text{Package weight}}{\text{Floor load}}$

   PROOF: $\frac{84}{200} = .42$ (Index).

8. Index $= \frac{\text{Cubic feet package in pile}}{\text{Pile height}}$

   PROOF: $\frac{3.36}{8} = .42$ (Index).

9. Index per 100 pounds $= \frac{\text{Index} \times 100}{\text{Package weight}}$

   PROOF: $\frac{.42 \times 100}{84} = .50$ (Index per 100 pounds).
   $.50 \times 16.21 = 8.105$ (cents per 100 pounds).

10. Index per 100 pounds $= \frac{100}{\text{Floor load}}$

    PROOF: $\frac{100}{200} = .50$ (Index per 100 pounds).

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11. Limiting weight = Index × 250.

PROOF: .42 × 250 = 105 pounds (limiting weight).
.42 at 16.21 cents per square foot = 6.8082 cents per package.
105 pounds at 6.484 cents per 100 pounds = 6.8082 cents per package.

12. Package rate $= \frac{\text{Desired earning per square foot} \times \text{package weight}}{\text{Floor load}}$

PROOF: $\frac{16.21 \times 84}{200} = 6.8082$ (cents per package).

13. Rate per cubic foot $= \frac{\text{Desired earning per square foot}}{\text{Pile height}}$

PROOF: $\frac{16.21}{8} = 2.02625$ (cents per cubic foot).

2.02625×3.36 (cubic feet package in pile) $= 6.8082$ (cents per package).

14. Rate per 100 pounds $= \frac{\text{Desired earning per square foot} \times 100}{\text{Floor load}}$

PROOF: $\frac{16.21 \times 100}{200} = 8.105$ (cents per 100 pounds).

15. Rate per 100 pounds $= \frac{\text{Index} \times \text{desired earning per square foot} \times 100}{\text{Package weight}}$

PROOF: $\frac{.42 \times 16.21 \times 100}{84} = 8.105$ (cents per 100 pounds).

TABLE OF INCHES REDUCED TO DECIMAL FRACTION OF A FOOT

Inches	Decimal	Inches	Decimal
1/4	.021	6 1/4	.521
1/2	.042	6 1/2	.542
3/4	.062	6 3/4	.562
1	.083	7	.583
1 1/4	.104	7 1/4	.604
1 1/2	.125	7 1/2	.625
1 3/4	.146	7 3/4	.646
2	.167	8	.667
2 1/4	.187	8 1/4	.687
2 1/2	.208	8 1/2	.708
2 3/4	.229	8 3/4	.729
3	.250	9	.750
3 1/4	.271	9 1/4	.771
3 1/2	.292	9 1/2	.792
3 3/4	.312	9 3/4	.812
4	.333	10	.833
4 1/4	.354	10 1/4	.854
4 1/2	.375	10 1/2	.875
4 3/4	.396	10 3/4	.896
5	.417	11	.917
5 1/4	.437	11 1/4	.937
5 1/2	.458	11 1/2	.958
5 3/4	.479	11 3/4	.979
6	.500	12	1.000

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AVERAGE OCCUPANCY OF WAREHOUSE SPACE

The total available space as defined on page 4 is the basis of all computations and estimates. A portion of this space is necessarily permanently unoccupied, and this has been divided into two classes — aisle space and working space. Another portion is sometimes occupied and sometimes unoccupied, and this has also been divided into two classes — waste space and idle space. All of these classes will vary in different warehouses and with different lines of business and the last one will vary as between different seasons or years.

Aisle Space. The permanent aisles required for the economical handling of goods from door to pile and from pile to door, or required by the fire regulations to furnish access for firemen, are estimated at from 20% to 25%. No warehouses were found where the actual figure was less than this estimate, and while there are many where it must be more, it was not thought proper to take into consideration a manifestly badly designed or poorly laid-out warehouse or an unsuitable building used for warehouse purposes.

Working Space. It is well known to all warehousemen that some vacant space is necessary at all times, or practically all times, to provide for regular customers; to furnish room for weighing, inspection or examination; sampling; rehandling of any kind, and to take care of unexpected demands for space. No warehouse can hold its customers long unless it constantly, or at least generally, has on hand some stock of the only line it has to sell, namely space for the storage of merchandise. How long can a merchant hold his trade without having any stock to fill an order? The necessary average of working space has been estimated at 5% to 12%, and this minimum is certainly conservative.

Waste Space:—The space left vacant by partial delivery of block or bulk lots and the space left vacant by failure of lots as received to entirely fill any space obtainable at the moment. This waste space is not to be readily estimated, but it is there just the same. Even unit lots of merchandise cannot be packed in a warehouse like toy building blocks in their box. Waste space is estimated at 0 to 8%, and again the minimum is manifestly low.

Idle Space. It is well known that there come in our business dull years or seasons that show a surplus of vacant space and deficit of earnings that must be taken care of in good years. In 1913 and 1914 Massachusetts warehouses averaged less than 40% capacity or 30% available floor space occupied. Next to aisle space this is the largest item of unoccupied space and it is one that cannot be avoided. The difference between the maximum and the minimum demand for storage is very great, and if warehouses as a whole are to be reasonably prepared to take care of the peak load they must necessarily average a considerable proportion of idle space. What that proportion is cannot be accurately determined, but an estimate between limits can be made. Those limits have been set at 0 to 40%. That maximum has undoubtedly been exceeded, but exceptional cases should not be considered in determining averages, and the maximum here used represents a not uncommon occurrence.

The result of these various estimates is:

Aisle space (including space occupied by columns)	20% to 25%	
Working space	5% to 12%	
Space permanently unoccupied		25% to 37%
Waste space	0% to 8%	
Idle space	0% to 40%	
Space unoccupied at times		0% to 48%
		25% to 85%

In other words, the maximum and minimum percentages of occupancy are respectively 75% and 15%, the extremes of vacancy being 25% and 85%. The mathematical average is 45%, but it has seemed to the Committee that good business management in a Standard Warehouse should produce a little better than that, and so the 50% figure has been used.

In considering this it must not be forgotten that 50% of available floor space occupied does not mean that the warehouse is only half full. It means that the warehouse is three-fifths to three-quarters full. From 25% to 40% of "available space," although it is "available" for business purposes, is not "occupiable" for goods on storage as it is necessary for aisles and working space. When a warehouseman has filled his occupiable space — from 60% to 75% of his available space — he is done, he is out of business for the time being, he can take no more business until after he has delivered something. That means that he must discommode old customers and decline new ones; his working force is idle though his pay-roll is still active and his handling account is developing a balance on the wrong side.

The Committee believe that these estimates are conservative and that the conclusion is defensible.

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HANDLING

The warehouse business has in many cases been very unprofitable in the past as a result of ignorant competition due to an absolute lack of knowledge of the cost of handling merchandise.

One of the most serious mistakes has been losing sight of the fact that there is a heavy overhead expense attached to handling operations. This oversight has practically made bankrupts of many warehouse concerns whose executives were experts on general problems and the handling of labor.

Unusual conditions, due largely to the war, have created an extraordinary demand for storage facilities. This has resulted in some warehouse concerns enjoying an era of prosperity who were in a rather precarious financial condition before the war. The demand for storage facilities caused many new warehouse concerns to enter the field. The inevitable reaction with its attendant period of competition requires careful consideration and demonstrates the need of every warehouseman in the country for a sound fundamental basis for complete knowledge of his own business.

The unscientific method commonly used for estimating handling costs was to determine the actual cost of the **in** movement of the goods; an arbitrary amount for delivery (varying all the way from 50 per cent to 150 per cent of the **in** cost) was added as an estimate of the probable delivery cost and the price was then quoted slightly, if any, higher than the resultant figure. Nothing was added for overhead expense, nor was consideration given to the various additional services furnished.

This method, when wages of warehouse labor averaged 20 cents per hour, made the handling rate appear to be about the same as the prevailing rate for storage. From this grew up the rough and ready idea of charging the same amount for handling as for one month's storage. Thus, the first month's charge would include the receiving and delivering of the merchandise and would be twice the charge for each succeeding month.

The actual result of following this method has been that some commodities were carrying the burden for others, or in other words some commodities were paying an excessive rate of profit, while others were handled at an actual loss; obviously the warehouseman would be far better off were he to discontinue accepting for storage the latter class of merchandise, if increased rates could not be obtained. By the same reasoning, when he determines the line of merchandise which pays the excessive profit, by catering to that line, possibly somewhat reducing his rates, he may apparently increase his final net income.

Studies by experts have so far shown that throughout the country the average overhead expense is at least 125 per cent of the direct pay-roll cost of laborers and checkers actually engaged in performing any particular handling operations.

The old method was **in** cost, plus estimated **out** cost, plus profit, or arbitrarily arrived at by making the rate the same as the storage rate. The correct method is **in** and **out** cost plus overhead, plus profit. Ten to twenty-five per cent is a very conservative amount to add to the combined direct labor and overhead cost of handling, for profit.

Wages have advanced to several times those paid since the old method of charging equal rates for storage and handling was first used. Taking into consideration these factors of increased wages, overhead expense and profit, it will be found that equitable handling rates may often be three or four times the rates shown in tariffs even now in use in some sections of the country, while, per contra, handling rates for some commodities may be less than the rate for storage.

The absorption in the handling charge (usually billed with the first month's storage) of the cost of unloading and loading cars, transfers from wharves to warehouses, cartage, weighing and other services has been a growing evil. It has in effect given indirect rebates to certain customers and substantially added to the losses of the warehouseman, or reduced his profits. It has been proved that in some instances the cost of handling and other services absorbed have made it impossible to earn one cent from certain lots of merchandise until they have been in store four months or more, actual losses being incurred on lots removed from store within shorter periods.

The simplest handling operation is the receiving of goods from the tail-board of a truck, the hoisting and piling in warehouse and the re-delivery to the tail-board of a truck (other services being sometimes required and sometimes not); it is therefore good accounting practice to make this the base operation charged for in the first month and make extra charges for extra services. Thus car loading and unloading should be charged for separately, as well as cartage, weighing or any other service required, each being based on productive cost plus overhead, plus profit.

In these days of advancing wages, cost figures at the time goods are received may be based on a wage scale far lower than when the goods are delivered. The present method of billing for receiving and delivering allows no opportunity of taking care of this possible source of loss. The proper method of handling this phase of the subject would be to charge for the handling **in** when goods are received and to charge handling **out** to the party then owning the goods when delivery is made. This is such a radical charge that it is not deemed advisable to make such a recommendation at this time.

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It is very essential that much data be secured in all parts of the country as to the productive labor cost of handling all kinds of merchandise. The American Warehousemen's Association has established a Central Bureau for the purpose of compiling data concerning handling costs; this information is being secured from all sections of the country and its value to a warehouseman cannot be overestimated.

Productive labor as used in this Report is understood to mean the wage cost of the laborers and checkers while actually employed on an operation for which the warehouse is making a charge.

In order to make these records valuable in all sections of the country, they should be computed on a man-hour basis. By the use of man-hours real comparison may be made and results may be easily translated into dollars and cents by applying the wage per hour prevailing in any particular locality.

In addition to the establishment of the Central Bureau, information bureaus in connection with local associations of warehousemen with paid Actuaries are being established throughout the country. Exchange of information in regard to man-hour costs between different parts of the country can thus be readily accomplished and all sections can quote reasonable rates even on commodities with which they are unfamiliar.

An example showing the method of applying this system of handling charges follows:

RECEIVING AND DELIVERING 1037 BAGS TAPIOCA

AVERAGE WEIGHT 152 LBS.

	TOTAL MAN-HOURS	MAN-HOURS PER PKG.
RECEIVING		
1 Checker, 9 men 5¼ hrs.	52.50	.05
DELIVERING		
1 Checker, 5 men 9½ hrs.	57.00	.054
	109.50	.104

Labor computed at 55 cents per hour.

	TOTAL COST	COST PER PKG. IN CENTS	COST PER 100 LBS. IN CENTS
Labor cost, 109.50 man-hours at 55 cents	$60.23	5.8	3.81
125% overhead	75.29	7.3	4.80
	$135.52	13.1	8.61
10% profit	13.55	1.3	.86
	$149.07	14.4	9.47

As the next package rate step above 14.4 is 15, this would be the handling rate to apply, assuming the example to be a fair average productive labor cost.

A method for securing productive labor costs as well as amount of overhead expense is shown in the later sections on Pay-Roll Division and Determination of Overhead.

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UNIFORM COST ACCOUNTING

Uniform systems of accounts and statistical records form the bedrock upon which any rate foundation or structure must be built if the building is to stand the tests which are bound to be applied either by customers or by public officials. This is as pertinent to warehousing as it is to transportation or any other form of public utility.

In calculating rates, statistical data must be available from many warehouses in order that averages may be obtained upon which to establish standards. Uniform systems of keeping the accounts and statistics by the warehouses will be necessary in order to justify rates made for storage, handling, car unloading and loading, or any other service rendered.

A suitable system of uniform accounting will necessitate:

I. CLASSIFICATION OF EARNINGS OR RECEIPTS.

Uniform classification with separate accounts for these earnings from all important sources:

(a) Storage.
(b) Handling.

NOTE. — Handling is here understood to mean the in and out handling from sill to sill of the warehouse, customarily charged in the first month.

(c) Weighing and sampling.
(d) Miscellaneous extra services.
(e) Loading and unloading cars.
(f) All other miscellaneous sources of revenue.

II. CLASSIFICATION OF EXPENSES.

Uniform classification of expense of operating, with separate accounts sub-divided as in earnings.

(a) Storage.
(b) Handling (corresponding to b, c, and d, under Earnings).
(e) Car Service.
(f) Expenses connected with miscellaneous sources of revenue.

III. DETERMINATION OF INVESTMENT.

(a) Plant	Land Buildings Private Street
(b) Equipment	Elevators Trucks, etc.
(c) Trackage facilities	Land Car Tracks Car Platforms

IV. DETERMINATION AND APPLICATION OF OVERHEAD EXPENSES.

All pay-roll items and other expenses which cannot be applied directly to Storage, Handling, Car Service, or any other particular service, must be analyzed and distributed according to a uniform plan. These being added to the direct costs, the entire or true cost of each service will be found.

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CLASSIFICATION OF EXPENSES IN DETAIL

EXPENSE (A) STORAGE

The storage expenses include the following items:

RENT, OR IN LIEU OF RENT.

1. Seven per cent on investment including buildings, land occupied by buildings and interest, taxes and insurance during construction.
2. Depreciation — 2 per cent on value of brick or concrete buildings and 3 per cent on frame buildings.
3. Obsolescence.
4. Fire insurance on buildings.
5. Taxes, Federal, State and Municipal, applicable to real estate.
6. Repairs to building.
7. Landlord's risk, amortization and profit on investment.

ADMINISTRATION AND OPERATING EXPENSES, TAXES, Etc.

1. One-third of executives' salaries, salaries of departmental heads, office salaries, general office and miscellaneous expense.
2. Watching.
3. Advertising.
4. Interest on working capital.
5. Taxes. Applicable to storage.
6. Contingencies.

Explanatory Notes (Expense (A) Storage)

INVESTMENT.

If the plant is rented, estimated values should be used.

DEPRECIATION.

Depreciation as usually allowed by the Internal Revenue Department is 2 per cent on brick or concrete buildings and 3 per cent on frame buildings.

OBSOLESCENCE.

Obsolescence as allowed by the Internal Revenue Department should be given due consideration.

REPAIRS.

This item comprises only ordinary repairs to keep buildings in good condition. Extraordinary repairs increasing the value of the plant should go to capital or investment accounts.

GENERAL EXPENSES.

An analysis of a number of warehouses shows that about two-thirds of the time of the office employees, and therefore the management also, is concerned with the various handling operations. Storage is rental and can be carried on by a very small force if a contractor or some other party attends to the handling. Office expenses, such as telephones, office coal and light, and sundry expenses are also included in this item.

WATCHING.

Watching is for the protection of the property and reduces the fire insurance rate. It, therefore, is a proper storage expense.

ADVERTISING.

Advertising for storage only belongs here. The warehouseman's principal business is that of storage, and handling is incidental to it; accordingly it is proper to consider advertising for storage purely a storage expense. Advertising for laborers is a labor expense.

INTEREST ON WORKING CAPITAL.

A certain amount of working capital is necessary to carry bills receivable.

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EXPENSE (B) HANDLING
(C) WEIGHING AND SAMPLING
(D) MISCELLANEOUS EXTRA SERVICE

1. Actual warehouse labor employed productively, including warehouse clerks, checkers and weighers.
2. Non-productive labor, including:
   Moving merchandise.
   Holiday time.
   Janitor and cleaning.
   Undistributed labor.
3. Liability insurance.
4. Seven per cent on the investment in equipment, including elevators, whips, trucks, scales, etc.
5. Taxes applicable to handling whether assessed on value of equipment, amount of working capital or on income.
6. Ten per cent depreciation on Item 4.
7. Repairs to equipment.
8. Power and light.
9. Claims.
10. Two-thirds of executives' salaries, salaries of departmental heads, office salaries, general office and miscellaneous expense. (Less amount charged to car service.)
11. Interest on working capital.
12. Miscellaneous supplies and expenses connected with labor.

NOTE A. — Items 2 to 12, inclusive, divided by Item 1 will produce the percentage of overhead expense for handling.

NOTE B. — Item 10 includes:

Executive salaries	Telephone
Salaries of departmental heads	Water
Office salaries	Coal for office heating
Office supplies	Contributions

and all miscellaneous small items of expense not directly chargeable to Storage, Handling, Car Service or other miscellaneous services.

Explanatory Notes

PRODUCTIVE AND NON-PRODUCTIVE LABOR.

The method of finding these amounts by divisions of the pay-roll is discussed in the section devoted to this subject.

EQUIPMENT INVESTMENT.

The investment in equipment should be determined by the warehouseman to furnish a basis for these figures.

POWER AND LIGHT.

Furnishing of power or light is a labor service, varying according to the amount of merchandise handled, storage as such not requiring either. They are therefore handling expenses.

(Storage should be kept a simple space rental proposition.)

CLAIMS.

This refers to breakage and loss claims due to negligence in handling merchandise. There are some claims which might be considered as storage liability, such as damage from leaking roofs. Each claim should be analyzed and placed where it belongs.

PORTION OF GENERAL EXPENSES.

Where the labor covers more than one service, it is defensible to distribute the overhead expense proportionally according to the percentage the gross billing for each service bears to the total gross billing for labor.

MISCELLANEOUS EXPENSE.

This covers items of general expense, directly chargeable to labor.

Lubricants for equipment, general care of equipment and employment departments are some items which are included.

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EXPENSE (E) CAR SERVICE

1. Actual labor loading and unloading cars.
2. Non-productive labor.
3. Liability insurance.
4. Seven per cent on investment in land, tracks and platforms.
5. Taxes applicable to Car Service.
6. Five per cent depreciation on investment in tracks, etc.
7. Repairs to tracks, etc.
8. A share of executives' salaries, salaries of departmental heads, office salaries and general office and miscellaneous expenses.
9. Interest on working capital.
10. Contingencies.

NOTE. — Item 8 should be determined as follows: Find the percentage relation which the billings for loading and unloading cars bear to the total billings, exclusive of storage. Credit the amount represented by this percentage to Item 10, Expense (B) Handling, (C) Weighing and Sampling, (D) Miscellaneous Extra Services, and charge a like amount to Item 8 under Expense (E) Car Service.

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System Illustrated by a Standard Warehouse constructed in 1920, showing Initial Cost of Plant with Estimated Capital, Fixed Charges, Operating Expenses, Operating Revenues and Net Return

This example has been prepared after exhaustive study of numerous estimates furnished by competent authorities, as a conservative illustration of the rates required to produce a reasonably adequate return. The majority of warehouse buildings constructed during 1920 have exceeded the estimated costs indicated below.

It should be carefully noted that this illustration covers a conservative estimate of the average cost of this type of warehouse and that the conclusions as to rates reached through its use must be revised upward or downward as the case may be, through consideration of local conditions, depreciation, land values, accessibility, etc.

SPECIFICATIONS

Standard re-inforced 200′ × 100′ (outside dimensions), six stories and basement, flat slab construction with brick or hollow tile panels. Three 12″ fire walls of brick or hollow tile equally dividing building into four sections, and two concrete enclosed stairways. Clearance between floors 10′ except 15′ on first floor. All floors having not less than 250 lbs. per square foot rated floor-load capacity served with standard dry pipe Sprinkler system, two source supply, with tank of 50,000 gals. capacity. Equipment consisting of four (4) 8000 pound elevators, four (4) double whip hoists, electric lights, inter-communicating telephones between office and each floor, operating office, shipping clerks' office and room for laborers, necessary plumbing, heating and furniture for offices and laborers' room.

(No figures have been included for interior tiering machines and wiring, but these should be installed in any warehouse handling heavy materials.)

Facilities for handling cars consisting of two (2) railroad tracks with capacity for five (5) cars each, platform 10′ wide on track side of building.

Area outside walls 200′ × 100′ × 7 = 140,000 square feet
Area inside walls 195′ × 98′ × 7 = 133,770 " "
Area available (taking out office, shipping and laborers' rooms, elevators and stairways) = 123,000 " "

ESTIMATED COST — 1920

LAND.		
For buildings	20,000 square feet	
For railroad siding and platform	7,000 " "	
For siding connection	1,000 " "	
	28,000 square feet at $2.00	$56,000.00
(No allowance is made for private streets which in many cases are necessary.)		
BUILDING.		
Construction, engineering and supervision including equipment and tank 140,000 square feet at $3.75		525,000.00
Two (2) tracks and platform 200′ × 10′		8,000.00
EQUIPMENT.		
Elevators, whips, wiring, heating, plumbing, telephones, partitions and furniture for offices, shipping room and laborers' room		50,000.00
Organization and charter		2,000.00
Interest on land during construction—1 year at 7%		3,920.00
Taxes and insurance during construction		11,620.00
Interest on building cost during construction		10,000.00
Working capital		83,460.00
CAPITAL ASSETS		$750,000.00

Every service rendered should be remunerative to the warehouse. To give anything for nothing necessitates an overcharge somewhere else.

(A) STORAGE

Estimated Income

123,000 square feet of available floor space at 96 cents per square foot per year based on 16 cents per square foot per month, 50% of space occupied $118,080.00

NOTE. — Main aisles and columns occupy 25 per cent of total space inside of walls after deducting elevators, stairways, office, shipping and laborers' room. The above basis of 50 per cent therefore presupposes an average storage occupancy throughout the year of 66⅔ per cent of actual occupiable storage space.

Estimated Expenses

RENT. (Or in lieu of rent)

1.	Interest on investment:		
	Building	$525,000.00	
	Land, portion occupied by building only	40,000.00	
	Organization	2,000.00	
	Interest, taxes and insurance during construction	25,540.00	
		$592,540.00 at 7%	$41,478.00
2.	Depreciation, building above foundation	500,000.00 at 2%	10,000.00
3.	Obsolescence	525,000.00 at 1%	5,250.00
4.	Fire insurance 90% of value of building above foundation	450,000.00 at ⅛ of 1%	562.00
5.	Taxes, Federal, State and Municipal		16,000.00
6.	Repairs to buildings	500,000.00 at 1%	5,000.00
7.	Landlord's risk, amortization and profit on investment	592,540.00 at 2½%	14,814.00
	TOTAL RENT (Or in lieu of rent)		$93,104.00

ESTIMATED ADMINISTRATION AND OPERATING EXPENSES, TAXES, Etc.

1.	One-third of executives' salaries, salaries of departmental heads, office salaries, general office and miscellaneous expense	$10,000.00
2.	Watchmen and watching supervision	2,500.00
3.	Advertising	3,000.00
4.	Interest on working capital—$50,000 at 7%	3,500.00
5.	Taxes	800.00
6.	Contingencies	2,676.00
	Total administration and operating expenses, taxes, etc.	$22,476.00
	Total storage expenses	115,580.00
	Net income from storage	2,500.00

Analysis

			AVERAGE SQUARE FEET FLOOR SPACE OCCUPIED	DOLLARS PER SQ. FT. PER YEAR	CENTS PER SQ. FT. PER MONTH
Storage income	$118,080.00	divided by	61,500	1.92	16.00
Storage expenses	115,580.00	" "	61,500	1.88	15.67
Profit	2,500.00	" "	61,500	.04	.33

INVESTMENT.

Working capital $50,000.00

2,500 divided by 50,000 = 5% profit on investment.

Attention is directed to the fact that the profit here indicated covers Storage only, profit arising from ownership of the building being provided for under Rent, on this page. The proprietor's salary is included in executives' salaries.

Expense Items not Included in Estimate

Bailee's responsibility and risk.
Loss and damage on goods.
Bad debts.
Maintenance of private highways.

Income Items not Included in Estimate

Short periods of storage.

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(B) HANDLING, (C) WEIGHING AND SAMPLING, (D) MISCELLANEOUS EXTRA SERVICE

Estimated Income

Receiving and delivering billed	$80,000.00
Weighing and sampling billed	7,000.00
Extra service billed	9,000.00
TOTAL INCOME	$96,000.00

Estimated Expenses

1.	Actual productive labor employed in receiving and delivering, weighing and sampling, and extra service		$38,000.00
2.	Non-productive labor		13,000.00
3.	Liability insurance		1,500.00
4.	Interest on investment in equipment—$50,000 at 7%		3,500.00
5.	Taxes		1,600.00
6.	Ten per cent depreciation on Item 4		5,000.00
7.	Repairs on Item 4 at 5%		2,500.00
8.	Power and light		3,000.00
9.	Claims		500.00
10.	Two-thirds of salaries, etc.	$20,000.00	
	Less amount charged to Car Service	5,455.00	14,545.00
11.	Interest on working capital—$26,000 at 7%		1,820.00
12.	Miscellaneous expense		4,000.00
	TOTAL EXPENSE		$88,965.00
	PROFIT		7,035.00

INVESTMENT.

Equipment	$50,000.00
Working capital	26,000.00
	$76,000.00

7,035 divided by 76,000 = 9.26% profit on investment.

Total expense	$88,965.00
Productive labor	38,000.00
Handling overhead expense	$50,965.00

Per cent overhead expense 50,965 divided by 38,000 = 134%.

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(E) CAR SERVICE

Estimated Income

Unloading cars		$21,000.00
Loading cars		15,000.00
		$36,000.00

Estimated Expenses

1.	Actual labor loading and unloading cars		$14,000.00
2.	Non-productive labor		6,800.00
3.	Liability insurance		700.00
4.	Interest on investment at 7%:		
	Land	$16,000.00	
	Tracks and platform	8,000.00	
		$24,000.00	1,680.00
5.	Taxes		750.00
6.	Depreciation on tracks, etc.		400.00
7.	Repairs on tracks, etc.		750.00
8.	Share of executives' salaries, office salaries, etc.		5,455.00
9.	Interest on working capital — $7,460 at 7%		522.00
10.	Contingencies		1,678.00
			$32,735.00
	PROFIT		3,265.00

INVESTMENT.

Tracks, etc.		$24,000.00
Working capital		7,460.00
		$31,460.00

3,265 divided by 31,460 = 10.38% profit on investment.

Total car service expense	$32,735.00
Productive labor	14,000.00
Car service overhead expense	$18,735.00

Per cent overhead expenses 18,735 divided by 14,000 = 134%.

PAY-ROLL DIVISION

In order that the warehouseman may determine his costs according to the method proposed, it becomes necessary to distribute the pay-roll. The foundation of this is the use of daily time cards, either in the hands of the individual laborers or gang foremen, giving the time of the man or men, information as to the lot of goods handled and the different services performed. To be of real value this must be carefully carried on with competent supervision and made to balance with the pay-roll. A portion of the results will be productive labor costs and the balance non-productive items, such as idle time, cleaning, moving merchandise to make room, etc.

DETERMINATION OF OVERHEAD

Next must be ascertained the overhead expense which applies to handling and other services. This is done by adding to the non-productive labor, the liability insurance, interest, depreciation, taxes, repairs to equipment and other items as shown in the classification of Expense B, C, D and E.

COST DEPARTMENT

We recommend that each warehouseman, if he has not already done so, organize a Cost Department, headed by a man who combines good accounting ability with a practical warehouse experience, furnishing him with as much assistance as is necessary to keep the work up to date at all times.

The American Warehousemen's Association has established a Central Bureau, referred to elsewhere in this work, which is prepared to furnish warehousemen specimen forms and information concerning methods of keeping cost figures. The Primer furnished by the American Warehousemen's Association outlines a simple method of cost finding.

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AN EQUITABLE PROFIT IN EACH DEPARTMENT

Each department of the warehouseman's plant should show a profit at the end of the year. No service should be rendered without profit. All profits should be reasonable.

Thus the Standard Warehouse Example shows profit after making due allowance for profit on the building, interest on the investment, and after salary to the proprietor, as follows:

STORAGE	$2,500.00
HANDLING:	
Weighing, sampling and miscellaneous services	7,035.00
CAR SERVICE	3,265.00
TOTAL	$12,800.00

No department should perform a service free or below cost to attract storage business, for indirect rebate is thereby given which will injure the business far more than the few dollars received for the storage gained.

This ideal condition, it is safe to say, has not heretofore existed in the warehouse industry.

CONCLUSION

The foregoing system of cost accounting and basis for tariffs, if carried out intelligently, will give the warehouseman the following knowledge:

Income, cost and profit of maintaining and operating each unit of warehouse space.

Income, cost and profit of handling each lot of merchandise from sill to sill.

Income, cost and profit of loading and unloading cars.

Income, cost and profit of weighing, sampling and all other services for which separate charges are made to the customer.

These fundamental facts will be of untold assistance in quoting and defending prices and setting a new and higher standard for the entire industry. A warehouseman will then have no hesitation in quoting rates to his customers because he will have that secure feeling that his rates are based upon proven costs with a legitimate profit added. These will also permit the warehouseman to exercise intelligent discrimination in the taking of merchandise to be stored by him.

Then, and only then, will the warehouse industry be enabled to ride out the squalls and serious storms which are bound to occur from time to time in the business world.

Respectfully submitted,

T. E. WITTERS,

Chairman.

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PACKAGE RATING STEPS

At a meeting in Washington, D. C., October 14, 1918, of representatives of the Food Administration, War Industries Board, the Bureau of Markets and the American Warehousemen's Association, it was agreed that the steps used in package ratings should be made in accordance with the following table:

Minimum charge per package — ½ cent

Packages from	½c.	to	2½c.	—	¼c.	rating steps.
" from	2½c.	to	5c.	—	½c.	" "
" from	5c.	to	10c.	—	1c.	" "
" from	10c.	to	20c.	—	2½c.	" "
" from	20c.	to	50c.	—	5c.	" "
" over	50c.			—	10c.	" "

When packages fall between ratings, the higher rate will govern.

At that time the "Bulk and Assortment" system of rate making was in force. With the recent change to the "Lot Unit" system and in the light of subsequent information relating to handling it became necessary to depart somewhat from the foregoing arrangement in constructing the package rate tables on pages 16 to 21. The present committee decided to increase the lot unit package rate 25 per cent for one-third lot unit quantities, 50 per cent for one-tenth lot unit quantities and 100 per cent for less than one-tenth lot unit quantities. It is obvious that a strict adherence to the foregoing table in acquiring rates for less than lot unit quantities would have resulted, in some instances, in rates considerably in excess of the percentages intended.

It has been demonstrated that it costs more per 100 pounds to handle small packages than for 100-pound packages of the same type and density. In order to provide for this it was necessary to eliminate from the lot unit column of the **Handling tables** the one-fourth-cent rating steps.

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